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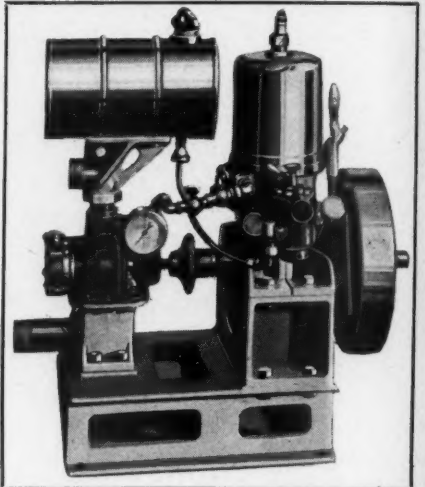
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AMERICAN FORESTRY

VOL. 27

DECEMBER, 1921

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WHAT OUR CHRISTMAS TREES ARE

BY J. S. ILLICK

THE forests contribute much to our happiness and welfare. Valuable gifts are flowing forth from them continuously, but at no season of the year are these gifts of greater value or deeper significance than at Christmas time—that season when happiness means giving.

An attempt to name all the good things that our forests give us at Christmas would be difficult, and might be tiresome. It would make a long list, for the products of the forest used annually for decorative and other purposes are many in number and vary widely. There are, however, a number of important Christmas gifts supplied by our forests that are of paramount importance. It will be to our advantage and satisfaction to get acquainted with them, for Christmas would be incomplete and lack much delight and merriment without them.

Christmas trees are the biggest contribution of our forests to our annual Yuletide celebrations. They bring much joy and happiness, but if the people really knew them well their joy and happiness would be multiplied many times. To know trees well is to love them. They are among the most lovable living things on the earth. They do so much good, help us in so many different ways, and yield so many essential things of every day life that they are really among the most indispensable natural objects on the face of the earth.

It is not difficult to get acquainted with our common Christmas trees. Each one of them has a number of outstanding features by which it may be recognized at

all seasons of the year. With a little effort we may bring ourselves in a closer relationship with these green joy bearers, and make our lives fuller and richer.

The principal Christmas trees of the East are the Firs and the Spruces. They comprise at least seventy per cent of all the trees that are used. In some

regions where these two groups of trees are not native or not easily obtainable, such other trees as the Red

Cedar, Hemlock, Arbor Vitae, White Cedar and the Pines are

used. In fact, every kind of evergreen tree is being used as a Christmas tree, but some of them are more desirable than others.

There has grown up a strong preference for the Firs and the Spruces, and wherever they are available at reasonable prices they are being used almost to the exclusion of all other kinds.

Both the Firs and the Spruces are native to the Northwoods. It is there that they grow at their best, and develop their beautiful foliage and attractive form. The beautiful Norway Spruce has its finest growth in Sweden and Norway, where its wood is known as Dantsic deal. The immense forests of Douglas Fir, in the northwest of America, where the trees attain a height of three hundred feet are famed everywhere.

And travelers never tire of describing the forests of silver fir in the mountains of northern Asia, where a tree less than 300 years old is not often seen. These two well-known groups of trees, the Firs and the Spruces may be distinguished from each other by the following characteristics:



WHAT WOULD CHRISTMAS BE WITHOUT IT?

Symbolizing happiness and the great love of the little Christ-Child for man, the Christmas Tree is truly the happiest tree of the year.

FIRS

1. Leaves are needle-like, not stalked, flat, often notched at the apex, dark green above and marked with two white lines on the lower surface.
2. Twigs are smooth.
3. Bark is smooth and dotted with blister-like balsam sacs.
4. Buds are heavily coated with varnish-like resin.
5. Cones are large and erect; cone scales fall from cone axis shortly after they are ripe.
6. Wood is without resin passages.

SPRUCES

1. Leaves are needle-like; short-stalked, 4-angled in most species, green on all sides, blunt to sharp-pointed.
2. Twigs are rough.
3. Bark is scaly.
4. Buds scaly, non-resinous.
5. Cones are small; cone-scales do not fall from cone-axis.
6. Wood contains resin passages.



THE BEST CHRISTMAS TREE OF ALL

The Balsam Fir is as well among the most attractive forest trees of the North woods.



BALSAM FIR HAS DISTINCTIVE CHARACTERISTICS

Its leaves are flat and blunt-pointed. The cones are cylindrical in outline and the cone-scales fall off soon after they reach maturity, leaving a slender bare cone axis.

There are 25 different kinds of Fir trees found in the world. Ten of these are native to North America, eight occur in the Pacific slopes and in the Rocky Mountain regions, and only two are found in the eastern United States, and one of these—Fraser's Fir—is limited to the high mountains of Virginia, North Carolina and Tennessee. The Grand Fir, Noble Fir, White Fir, and Red Fir are the most important of the western members of the Fir group. All of these trees have such a strong resemblance to one another that a description of one of them may suffice for the group. The Balsam Fir is unquestionably the best known and most widely distributed of our native Firs. It is one of the most beautiful evergreen trees native to North America. It frequents bogs, swamps, and other wet places. Among its chief associates are the American Larch, Arbor Vitae, Black Spruce and Red Spruce. Its companion species are not many for few trees can withstand the extreme wet and cold conditions of our northern bogs and swamps.

A mere glance at a Balsam Fir tree is usually sufficient to distinguish it from any other eastern forest tree. No other American evergreen tree is more attractive. Most people who have lived or visited the north-woods, where the Balsam Fir grows naturally, have a distinct and lasting impression of its appearance. It is the prettiest among all our Christmas trees, for it has an attractive form, dense crown, and beautiful foliage, which persists long after other trees have dropped their leaves.

The leaves of the Balsam Fir are distinctive. They are flat, dark green on the upper surface and pale green with two white lines on the lower side. They are without stalks, and consequently, when they fall off, the twigs to which they were attached present a smooth surface. This absence of leaf-stalk accounts for the fact that the

leaves persist much longer after the trees are cut than on many of our other conifers. The leaves appear to be arranged in two horizontal rows, one on each side of the twig, but a close examination of the twigs will show that they originate along a spiral line which extends around the twigs, but assume a two range position in order to get as much light as possible.

There is another characteristic by which the Balsam Fir may be distinguished. A careful examination of the



HOLLY FOR CHRISTMAS

The leaves of the Christmas holly are deep green, stiff, and armed with spines along the margin.

trunk of a tree will reveal a large number of little blister-like sacs of balsam. If one takes a knife and punctures them the balsam will flow forth freely, or if a knife is lacking, one may take the finger nail and push it into the little blisters and there will flow forth immediately a small quantity of balsam, as clear as crystal. This balsam when refined is used in making microscopic slides in our scientific laboratories. It is used chiefly to attach cover glasses to microscopic slides.

In some localities the balsam is collected for medicinal purposes by the inhabitants. It is regarded as an excellent medicine in the treatment of throat and pulmonary troubles. I have observed many mountaineers collecting the balsam from the blisters on the trees and then store it away for family use. Such home-made remedies are prized far more highly, and are actually of greater value, than many city people appreciate, for the people who use them often live many miles from the nearest

physician and consequently must depend upon home-made remedies.

The buds and cones of the Balsam Fir are also very distinctive. The buds are almost round in outline, about one-sixth of an inch long, clustered at the end of the twig and appear to be covered with a coating of varnish. The cones are from two to four inches long, cylindrical in outline, and stand erect on the twigs. Their scales fall off soon after they reach maturity and leave a bare central axis. This is an unusual habit among our evergreen trees.

It is a common practice in the Northwoods to collect large quantities of leaves and use them in filling pillows and cushions, for the leaves when dried emit a very fragrant balsam odor. The wood is soft, does not contain resin passages and ranges in color from white to brown. It weighs about 24 pounds per cubic foot and is used extensively in the manufacture of paper pulp, crates and packing boxes.

The Balsam Fir is a tree which satisfies many human wants, but the greatest of all its gifts is the Christmas tree. As a Christmas tree it has no superior, and in many localities no other native tree has Christmas tree qualities that even approach it. The European Fir, so common throughout many parts of Continental Europe, has

many characteristics in common with our Balsam Fir. It, too, has been used for centuries as a Christmas tree. The similarity between these two trees is very marked, which may have helped develop our high regard for the Balsam Fir and rate it as the foremost Christmas tree of the eastern United States.

There are twenty different kinds of Spruce trees in the World. All of them are beautiful evergreen trees. The



BALSAM FIR BARK

The bark of the Balsam Fir is smooth and of a grayish tint.

occur in every country in the northern hemisphere. Eight of them are native to North America, three being found in the eastern part and five in the western part of the country. The three eastern species are:

1. White Spruce,
2. Black Spruce,
3. Red Spruce.

All three of them are at home in the Northwoods, where they have a very wide distribution, one of them extending from the Atlantic Coast clear across the continent. Our native Spruces have so many characteristics in common with one another that it is not necessary to point out the fine lines



Courtesy Amawalk Nurseries

NORWAY SPRUCE

Beautifully symmetrical, this species is a great favorite for use as a Christmas tree.

reason why the needles of the Spruce fall off from the twigs so much sooner than do the needles of the Fir. It follows that in selecting a Christmas tree it is recommended to procure a Fir whenever possible, for they have a beautiful foliage and the leaves will remain on the trees much longer than those of most other evergreen trees.

Our forests have been depleted of Christmas trees to such an extent that it is now imperative to take measures to insure a future supply. The first step that is necessary is the proper protection of our forests from forest fires.

The planting of evergreen trees for Christmas purposes is now an estab-

of distinction that exists between them, for the average householder who desires to know the name of the Christmas tree that adorns the home, will be satisfied to know that the tree is a Spruce, or some other kind of tree. One may readily recognize the spruce trees by their needles, which are not flat like the Balsam Fir, but 4-sided. The needles are attached to the trees by means of tiny brown stalks, which are entirely absent in the Balsam Fir. This difference between the Spruces and the Firs is the



Courtesy Amawalk Nurseries
HEMLOCK

Popular as a Christmas tree in some sections, the chief objection to it is that it does not live long after it is cut; dropping quickly.



IDENTIFYING CHARACTERISTICS OF NORWAY SPRUCE

The Norway Spruce is being planted extensively for Christmas trees. Its cones are about 5 inches long, its leaves are short and 4-sided.

lished and profitable business in some localities. There is a private forest of about 1,500 acres in Pennsylvania upon which 560 acres have been planted to forest trees. Among the planted trees suitable for Christmas tree purposes are Norway Spruce, Douglas Fir, White Fir, White Spruce and a few other evergreen trees. Planting operations did not begin until 1919, but they have continued annually since then. A careful study of the established plantations shows that the trees crowded each other as they increased in height and extended their



A CHRISTMAS TREE FARM

This is located in Berks county, Pennsylvania. The thrifty young trees in the foreground are Norway Spruce.

lateral branches. The Forester in charge found that it was advisable to remove some of the trees for the ultimate good of the plantation and began to inquire if he could market them as Christmas trees. He went to a nearby city and found that he could dispose of some of the trees. In a few years the demand for home-grown Christmas trees became very strong, and now there exists a ready market for his entire output. As a result of this development a net profit of \$3,800 was realized in 1917, \$4,300 in 1918, \$5,350 in 1919, and \$6,200 in 1920. The growing of Christmas trees is now a profitable business on this forest. Numerous plantations have been established for the purpose of raising evergreen trees suitable for decorative purposes at Christmas time. It is reasonable to assume that they will be successful and profitable from a financial point of view, and will help relieve the Christmas tree shortage which is now developing rapidly.

In regions where the Firs and Spruces are not avail-

able, the Red Cedar is often used as a Christmas tree. It has a characteristic conical to pyramidal form and develops a dense and attractive crown. It is frequently found naturally along fences, roads, abandoned fields and open hillsides, where it forms a distinctive but impressive feature of the landscape. When it develops in such open situations it is well adapted for use as a Christmas tree.

Another tree that is sometimes used is the Hemlock. It, too, just as the Spruces, has leaves that are attached to the twigs by tiny little stalks, which cause them to drop off shortly after the trees are cut. Those who live close to the forest and can procure a hemlock tree a day or two before Christmas, will find that it gives satisfaction, for if not kept too long after it is cut, the needles will persist and the tree will serve as a Christmas tree.

Local customs have much to do with the selection of Christmas trees. In some localities the pine trees are well liked and used rather extensively, but they do not have the desirable form or the attractive foliage required of a good Christmas tree. The pines are not difficult to identify for their leaves are put up in the form of long slender needles, and arranged in clusters of two, three, four or five.



Courtesy Amawalk Nurseries

COLORADO BLUE SPRUCE

An ornamental tree, the Colorado Blue is coming into a new use in some sections, being carried into the house in a large tub and used for a Christmas tree.



BLACK SPRUCE BARK

The bark of the Black Spruce is covered with thin grayish brown scales.

The White Pine has its needles in clusters of five, while those of the Pitch Pine occur in threes, and those of the Jack Pine in twos. The western White Pine and the Sugar Pine, like the eastern White Pine, have their needles in clusters of five. The Short-leaf Pine of the South has its leaves in clusters of two or three, while the Long-leaf Pine has its needles in clusters of three, and range in length from 12 to 18 inches. The Long-leaf Pine is rarely used as a Christmas tree, but during the past few years enormous quantities of branchlets of this tree, covered with dense tufts of foliage, have been shipped into the northern markets and sold as "Louisiana Palms" and "Florida Pines." The demand for this material appears to be growing, and it is quite likely that a permanent market may be established, but it is hoped that some method of cutting will be used that will not interfere with the regeneration of the forest or

mutilate the trees from which the branchlets are cut.

Christmas trees are not the only gifts of the forest used for Christmas decoration.

The holly wreath is one of the oldest, best known, and most widely used decorative designs used at the Yuletide season. To really know the holly is to love it. It has held a prominent



NEEDLE-LIKE LEAVES AND CONES OF RED SPRUCE

The three spruce trees native to eastern North America are used extensively for decoration at Christmas time.



RED SPRUCE BARK

The bark is ruddy brown, becoming grayish with age.

place in the legends of old, and is frequently mentioned in history, and prized highly today.

The American Holly, also called Christmas Holly, and the closely related European Holly, are linked inseparably with our Christmas traditions. Many people are familiar with the holly leaves and berries, but few of them know that they grow upon trees which are common in the coastal plain regions of the South and found locally as far north as Pennsylvania and along the Atlantic Coast to southern Maine.

While the Christmas Holly may reach a height of 50 feet and a diameter of 2 to 3 feet in Arkansas and Texas, it rarely exceeds 20 feet in height and a few inches in diameter in the extreme northern part of its natural range.

The northern migration of the Christmas Holly is really an interesting story. This tree is a native of the southland, reaching its greatest abundance in the coastal plain regions, its largest size in Texas, and great-

est beauty along the foothills of the Carolinas. For centuries it has been pushing northward. Progress was made slowly. Each forward step meant the sacrifice of many individual trees that were not hardy enough to withstand the cold winters of the North. It, however, advanced step by step, and with each forward stride became hardier and better fitted to struggle for an existence. After many years of struggle it became firmly established in the southern and southeastern part of Pennsylvania, especially along the banks of the lower Susquehanna River. In time it became fairly abundant in this region, and after a few generations of trees had grown up in this region, they produced a young race of baby trees which were quite frost hardy. These in turn produced frost-hardy seeds, which by chance were carried by birds or some other agent and dropped upon favorable sites still farther northward. These seeds in turn developed into small trees which in time produced seed with even more frost-hardy characteristics. Thus,



Courtesy Amawalk Nurseries

THE AUSTRIAN PINE

One of the most beautiful of the ornamental evergreens and sometimes used as a Christmas tree.

is the history of the Christmas Holly trees that now stand in Dauphin County in central Pennsylvania, which for many years were regarded as the most northern known station of this tree in Pennsylvania. On December 12, 1921, a new station of the Christmas holly was outpost is along Chatham's Run, Clinton County, at an altitude of about 600 feet above sea level. Here occurs found fully a hundred miles farther northward. This

only one solitary specimen. It is the most northern inland station that is now known.

The Christmas Holly can readily be recognized at all seasons of the year by its deep green leaves which are armed with spines along the margin. The leaves are so bright that they often reflect light as mirrors. The small bright red berries are also a helpful means of identifica-



A NEWCOMER FROM OUT OF THE WEST

The Douglas Fir, native to the forests of the Pacific Coast and Rocky Mountain regions, is now being grown in Pennsylvania as an ornamental and Christmas tree.

tion in fall and in winter. An old manuscript in the British Museum states that the "Holy hath berys as red as any rose." This has led to the belief that early writers called it the "Holy Tree." Devout people regard the leaves of the Holly as a symbol of the Saviour's crown of thorns.

Unquestionably, the holly wreath is attractive and popular, but unfortunately the methods of collecting the branches is very destructive. In many instances, the tops of the trees are cut out completely, leaving nothing but an erect bare trunk. We need the holly sprig for decorative purposes at Christmas, but in order that a future supply may be insured, special steps must be taken at once to regulate the cutting in such a way that all the existing trees may continue to produce annually an abundant supply of thrifty branchlets.

Another Christmas gift of the forest is the Mistletoe. It is the only parasitic plant that is used for adornment at Christmas time. It is sometimes called a tree thief,



A SOUTHERN CHRISTMAS TREE

The Red Cedar is used extensively in the Southern and Central States as a Christmas tree.

for it gets all its nourishment from the trees upon which it lives. Traveling throughout the South one may see thousands of trees literally festooned with the Mistletoe. It sometimes grows in the form of a witches' brooms, or one may see it dangling down from the branches of a tree in graceful array. A careful study of the life habits of this unique plant will reveal the fact that it always appropriates for its own development the life blood of the tree upon which it feeds.

There are more than four hundred species of Mistletoe known in the world. Most of them occur in the tropics, and nearly all of them are parasitic. Many varieties are found in the United States. They occur from the coast of New Jersey southward and westward.

The Mistletoe is so common in the State of Oklahoma that it has been selected as the State flower. If you question an Oklahoman about this parasitic plant as a State flower, he is likely to answer that if man may

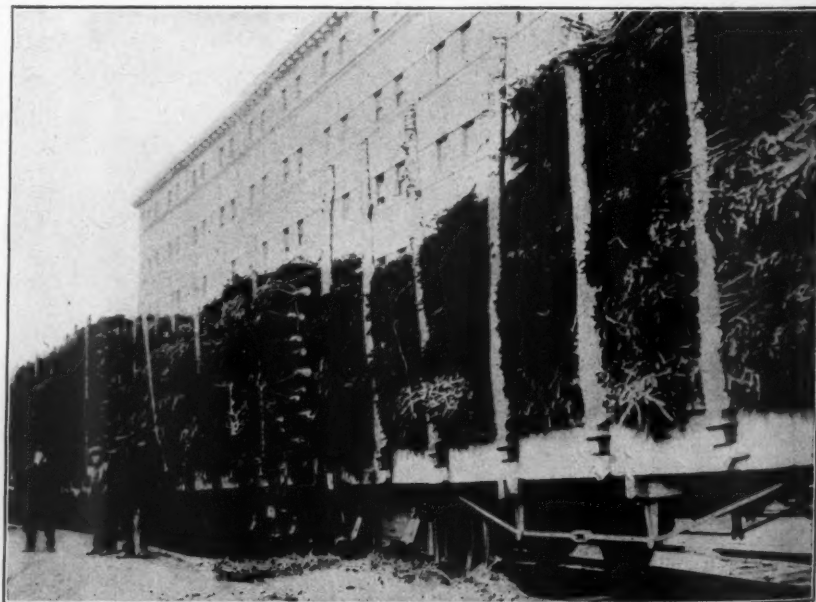
tap the Maple tree for sugar, and the Pine tree for turpentine, it is fair for the Mistletoe to tap trees so that it may develop and become available for decorative use.

The Mistletoe is not only unique in its appearance, and in its flowering habits, but also because of its structure. A careful examination of the leaves of the Mistletoe will reveal that they are almost nerveless, thick and fleshy, and if one has a magnifying glass and examines the lower surface of the leaves he will find only about 200 breathing pores to the square inch, while in the common Lilac there occur at least 200,000 breathing pores to the square inch.

The white fruit of the Mistletoe is attractive and unique in its make-up. The seed is covered with a gelatinous covering which adheres very readily to the feet of birds, and is thus carried to the twigs and branches of trees upon which it germinates and begins to grow. When the seed puts out roots they always turn towards the branch, no matter whether they are located on the upper or lower side, and experiments conducted by the writer show that the new sprouts will even turn towards glass.

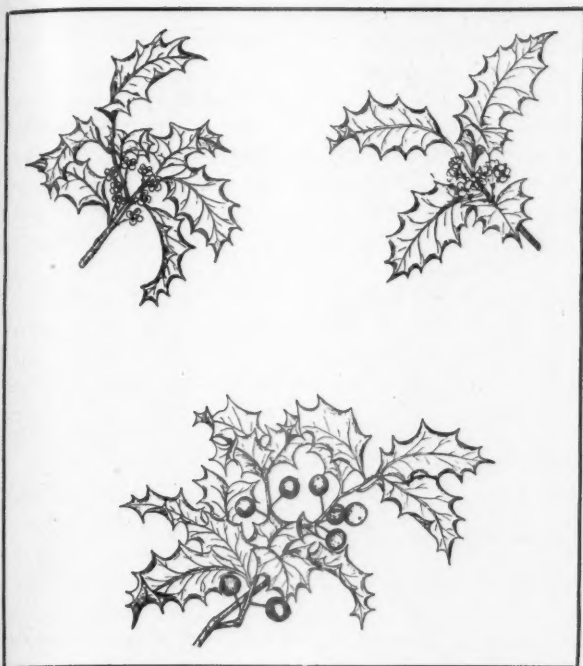
Few people may know that it is possible to propagate the Mistletoe. The writer has planted the seed collected in our market places at Christmas time upon the branches of trees, and observed that they germinated and developed into tiny and thrifty little plants. In planting seeds of the Mistletoe it is important to know the trees upon which it prefers to grow for it will not develop upon all kinds of trees. Some of the trees upon which it prefers to grow are the Elms and the Hackberries. Both of these groups are close kin of the Mistletoe. Locally it is also abundant upon Sycamore and Gum trees.

Large quantities of Trailing Pine, also known as Princess Pine, and Ground Hemlock are used at Christmas time. These plants really are not pines or hemlocks, but are closely related to the ferns. They belong to the group of plants which are technically known as Lycopodium. A number of different species are common in open situations in our forests and are gathered in enormous quantities for decorative purposes at Christmas time. They belong to an ancient race of plants, so ancient that only a few remnants of them are left, and they have now degenerated to mere trailing



ON THEIR WAY TO CELEBRATE CHRISTMAS

Thousands of evergreens are shipped yearly for use as Christmas trees and Yuletide decorations, and this is a typical carload.



BOTANICAL STUDIES OF THE HOLLY

The American Holly is linked inseparably with our Christmas traditions. The pollen-bearing and seed-producing flowers usually occur on different trees.

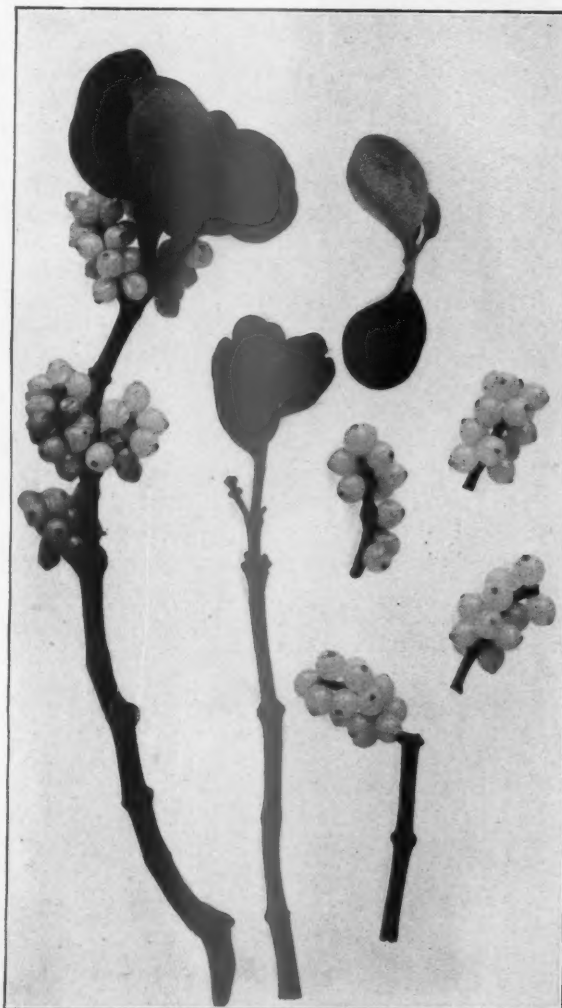
plants, while in ancient times they were the prevailing type of vegetation found in many places upon the face of the earth, and among their members were many stately trees.

When we consider the many gifts with which our forests supply us at Christmas time, we cannot help but realize that Nature is liberal with us. When our country was still new and undeveloped, decorative material for Christmas use was super-abundant, but as the population increased the demand for it increased proportionately, and in time the supply began to dwindle. Now the demand is so great and the supply so small that something must be done to insure a future supply. Many suggestions may be made to meet the situation, but there are only two practical solutions to this great problem. It is imperative that the existing supply must be given adequate protection and harvested with care. This means that our forests must be given adequate protection in order that there may continue to flow forth from them a continuous flow of necessary Christmas gifts, which means that the great curse of our forests—forest fires—must be stopped. There is no better way to insure a future supply of Fir and Spruce trees, Holly wreaths and Mistletoe than by making our forests fire-proof.

Then, too, we have reached the point of our economic development when it would be almost criminal for us to depend entirely upon nature's gifts. It is our duty to help nature, and wherever possible to improve upon her way

of doing things. We may do this by actually growing much of the decorative material required for Christmas time. We can grow Christmas trees from seeds, and we can propagate the Holly and the Mistletoe. It is an established fact that Christmas trees may now be grown at a profit. It is not a mere pastime for the rich, but a paying business.

Just as Christmas trees are now being raised at a profit, so it is also possible to raise the Christmas Holly and the Mistletoe by artificial means. In this way an



Courtesy Forest Pathology, Department of Agriculture.

THE FAR-FAMED MISTLETOE

The only parasitic plant that is used for adornment at Christmas time, and truly a "tree thief" because it gets its nourishment entirely from the tree upon which it lives.

adequate supply may be insured for the future, and all those who will contribute towards the development of successful methods of propagating these plants will insure the welfare and happiness of future generations and bring immeasurable blessings to unseen faces.

THE CUTTING OF CHRISTMAS TREES

BY ALFRED GASKILL

STATE FORESTER OF NEW JERSEY

IT may be admitted that the practice of wasteful cutting in producing Christmas trees is as objectionable as wasteful cutting by lumbermen. It is a fact, however, that the production of Christmas trees is a perfectly legitimate industry which can be practiced in complete accord with the accepted method in forestry. In fact, it is entirely possible to produce Christmas trees upon ground that is devoted to the production of timber, or pulp wood.

The hills of Vermont are counted on to produce each year some 5,000,000 trees for decorative purposes. That means that approximately 5,000 acres of rough Vermont land are to yield a paying crop in the form of Christmas trees. It may be doubted if any other crop that could be taken from such land would be so remunerative. From the standpoint of economics therefore the industry is justifiable, and if it be pointed out that Vermont has 2,500,000 acres of such land, which the owners would do well to utilize, as they do not now do for the production of Christmas trees and lumber, they and their State would benefit largely.

If forestry is to establish itself it must be upon a practical basis. Foresters everywhere are striving for a rec-

ognition of this rule. They do not exclude from the list of forest products anything which benefits humanity, and enlists the owner's interest by being profitable to him.

We have several forest states. Part of their wealth has been derived, and probably always must be derived, from forests. The extraction every year of several million Christmas trees will do good rather than harm, provided the industry is established on a rational basis.

Surely the introduction of forest greens into winter homes and wintry surroundings is gladdening, uplifting, mellowing, and tends to loving kindness, as well as jollity. Barring occasional accidents, I feel strongly that any effort to rob the Christmas spirit of its woodland quality would be most unfortunate.

Even if it were necessary to sacrifice something of our forests to support this idea it would be worth while, but no sacrifice is necessary. We can have Christmas trees in abundance and more and better forests through a stimulation of Christmas tree production rather than through an effort to curtail it.

AN AGE-OLD CUSTOM

VERY commonly the question is raised as to whether the cutting and use of trees for Christmas purposes is not a great waste, and whether steps should not be taken to discourage or prohibit it. In the opinion of forestry officials the custom is so old, so well grounded, and so venerated, that even if it were economically somewhat indefensible, these aspects will and should continue to outweigh economic considerations. It is denied, however, that pure economic considerations would lead to the abandonment of the Christmas-tree custom. Trees are for use, they argue, and there is no other use to which they could be put that

would contribute so much to the joy of mankind as their use by children on this one great holiday of the year. Further, particularly in the Northeastern States, a large

proportion of the Christmas trees are cut from pasture lands on which they are encroaching or from land which would be cleared up in the ordinary course of farm improvement. The trees would be cut in any event. A market for them gives the owners some return for their labor if nothing more. It is true that in the vicinity of



CHRISTMAS TREES—REAL ONES, IN FESTIVE ARRAY

large cities, the Christmas-tree supply is sometimes secured in such a way as to be destructive of young growth and this, of course, should always be discouraged.

That the use of Christmas trees is perfectly compatible, however, with the welfare of the forest is fully proved by the practice in the European forests. The cutting of small trees for Christmas is not there considered in the least as a menace to the forest but as a means for improving the forest and a source of revenue, and is therefore constantly encouraged. It is not by denying ourselves the wholesome pleasure of having a bit of nature in our homes, forest officials say, that we shall preserve our forests, but by learning how to use them wisely and properly. The following rules are laid down by the United States Forest Service for the woodland owner who wishes to improve a rather dense stand of evergreens and market the good trees for Christmas purposes:

(1) Find a market for Christmas trees of the species which are growing on your land.

(2) Go through the woodland carefully, pick out and mark the most vigorous specimens of trees. These should be allowed to remain to form the mature stand of timber.

(3) Mark for removal the trees which are crowding these better specimens.

(4) Cut as many of these inferior trees as there is a suitable market for. Cut them carefully to avoid damage to the remaining trees.

(5) Remove them carefully from the area and market them in accordance with instructions from the buyer to avoid any cause for dispute.

THE CHRISTMAS TREE

By Alexander Blair Thaw

Wandering tribes now roam
The hills of Lebanon,
Knowing not house nor home;
Gone the great cedars, gone
That temple built of them
Once, in Jerusalem.

Once, through the groves of Greece,
Down from the Delphic slope,
Rang their great songs of peace,
Filled with a burning hope,
Bearing strange prophecy
Of mortal liberty.

Once our forefathers heard,
Under the sacred oak,
Some strangely muttered word,
Whispered by tongues that spoke
Forth from the Druid tree,
Darkly, of things to be.

Though to our senseless ears
The leaves no longer sing,
Yet, through the lapse of years,
A still small voice doth bring
Peace upon earth again,
And freedom to all men.

Set on a little hill,
Over a world that grieves,
One living tree shall still
Scatter its healing leaves,
Gathered for our distress
Out of the wilderness.

Out of the desert wild
Comes, with a heavenly voice,
News of a new-born child,
Bidding the world rejoice,
Bringing all those who roam
Back to each earthly home.

Now all the fruitful earth
With heaven is reconciled,
Since, on each sacred hearth,
And in her forests wild
Under the open skies,
Songs of pure love arise.

Tree Stories For Children

The First Christmas Tree

By Mary Isabel Curtis

TO almost every boy and girl at holiday time a tree means a Christmas tree. But how much, I wonder, do you children really know about this most beautiful tree of all?

Many, many years ago when Joseph of Arimathea came from Palestine to England to tell the English people all about the life and death of Christ, there had never been a Christmas tree in any country in the world. Very few people lived in England at that time and those who did live there were wild, rough men and women who did not welcome strangers to their land.

Joseph and his friends were glad enough when they reached England after a long and stormy voyage on the ocean—for in those days there were no comfortable, big ships such as we now travel on. They had come all the way from Palestine in a little open boat exposed to bitter, winter weather, and were cold and tired and weary of the sea.

After they landed they started to travel back into the interior of the country hoping to find some kindly shelter. But no one would receive them. On Christmas-eve their food was gone; they were exhausted and almost perishing with cold when they came to a little hill, that ever since that day has been called "Weary-all." There Joseph, in deep discouragement, dropped down on a rock to rest.

"I have strength to go no farther, my courage has departed and my hope is as dead as this staff in my hands," he declared.

As he spoke Joseph thrust his staff into the ground. Suddenly, to the amazement of them all, the dead wood began to grow. It put forth branches covered with green leaves, and then before their wondering eyes broke into fragrant blossoms. The dry stick of wood had changed into a noble hawthorn tree.

"It is a miracle!" they cried, and all dropped on their knees.

Then one of them recalled a tale that he had heard of how the trees in Paradise had blossomed on the night the Lord was born.

"It is a sign from God," said Joseph, "that He will protect us. Let us end our wanderings and settle in this place."

Strength came back to their limbs and courage to their hearts, so that they were able to construct a few rough houses out of mud and branches. And beside the miraculous thorn tree they built a little church, which later on was added to, and became the famous Glastonbury Abbey.

For many years the sacred thorn tree blossomed every Christmas-eve, and the fame of the repeated miracle spread over all the land. Even today, if you should go to England, you can go to Glastonbury and some one will show you where the thorn tree grew.

The Christmas trees we have and this first Christmas tree all blossom for the same reason; only instead of living flowers, the Christmas trees today blossom out with lights and shining ornaments and glistening stars put there by loving hands because the baby Christ was born.

ENGLAND'S NEW FOREST POLICY

BY ARTHUR NEWTON PACK

(With photographs by the author.)

This is the first of a series of articles on forestry conditions in Europe, written by Mr. Pack when, as Commissioner for the American Forestry Association, he spent three months in Europe examining forestry conditions and interviewing forestry experts in Great Britain, France, Germany and Belgium.—Editor.

ENGLAND has commenced in the last two years what France first undertook two or three centuries ago; what the German states began at almost the same time, and Denmark a little later; what Sweden and Norway faced twenty-five to fifty years ago, and what Canada and the United States must face today. Although, in the centuries succeeding its inception, the forest policy of the

taken bodily from any one nation can apply in toto to another. Even Great Britain found that the same rules could not be applied to every district, but she has formulated, adopted, and put into effect a forest policy, and the results show that the organization and method she has worked out is at least fundamentally sound.

It seems strange, perhaps, that England could so long have avoided the issue, but the circumstances of British colonization in the New World and the facilities for lumber import engendered by her control of the seas, were undoubtedly responsible. Periodically, to be sure, the government took some interest in growing trees, especially in the days of wooden ships, but when steel tonnage drove the old wooden vessels from the seas that interest again flagged, and England found herself at the beginning of the war an importer of 90 per cent of the timber she consumed.

No event in history has contributed such emphasis to utilization of natural resources as the war with Germany, and in 1916 and 1917, faced with the necessity of allocat-



THE FIRST STEP IN AFFORESTATION

Many thousand spruce seedlings from seed sown last spring under the direction of the Forestry Commission in southern England, the need for regrowth being fully recognized.

continental European nations has become such a part of their daily life that they are prone to forget it ever had a beginning, we must not forget that, almost without exception, they took up forestry only when the almost complete exhaustion of their forest resources showed that their very existence depended upon them. The United States is in urgent need of a forest policy and there are bills now before Congress providing one. Only if we are progressive enough to profit by the lesson of Europe and adopt a forest policy now, can we avoid a similar calamity. (Thus far Sweden has been the only nation to act before her keenest suffering began.) No plan



REFORESTING THE WAR CUTTINGS

This plantation of Scotch pine in the New Forest is typical of the work of the Forestry Commission in replanting the cut-over areas. Thriving young plantations are seen everywhere.

ing her ships to the importation of food, Great Britain awoke to find her forest resources far below their possible extent or productive capacity. To supply the pit



GROWING MINE PROPS FOR THE FUTURE

Almost at the back door of the famous Welsh coal mines these men are preparing the ground for a plantation of Douglas fir, which, because of its very rapid growth, will supply pit-props from the required thinnings in a minimum period of time.

props for her mines and help take care of other war and home needs one-half of all the productive woodlands of the United Kingdom fell before the ax.



A GLIMPSE OF LOCH NESS

In the foreground may be observed a small plantation of Douglas fir made during the war. This is a portion of one of the many private estates the acquisition of which by the British Forestry Commission has been made possible through the financial break-up of many of the old landed families.



THE FORESTER'S FRIEND

Small scattered sawmills such as this one among the mountains of northern Scotland render the creation of new forests commercially practical by supplying a nearby market for the timber.

When peace came and shipping was released, England might have gone on as before, but the treaty of peace showed only too clearly that not only were future wars possible, but that certain international hatreds were receiving freer play. The British military authorities were among the first to urge the reforestation of the woodlands cut during the war, and the investigation committee which was the outgrowth of their efforts brought forward a still more astounding fact. The United States and Canada, said the report, were rapidly advancing toward a degree of destructive deforestation which would eventually remove them from consideration as large timber exporting



INCREASING THE FOREST YIELD

Converting an old hardwood forest in Gloucestershire to rapid growing conifers. Note how even the branches of the old trees are sawed and piled for fuel wood.

countries. High lumber prices in Sweden and Norway had only served to emphasize to those nations the importance of conserving their timber supply by a restriction upon the output. France and even Germany could not quite supply their own needs and that nation which did not conserve and build up its own natural resources would be the first to suffer.

So much was the British Parliament taken aback by the findings of this committee that it passed almost immediately a bill embodying its recommendations. Fundamentally, the law which created the British Forest Commission is simply a recognition of the government's cardinal duty of assuming the largest share of the burdens of reforestation. It recognizes, however, that the government could not and should not attempt a forest monopoly, and provides for assistance to private owners, not only in the form of advances for carrying on planting, but also through the reclassification of potential woodlands for tax purposes. It specifically stipulates that any private owner who will adopt proper methods of forest growth and conservation may receive a tax rebate until such time as his forest shall come into practical commercial production, and the tax is then to be based, not upon the capital value of such land or forest, but upon the actual income derived therefrom.

Under the efficient leadership of General Lord Lovat, who in the capacity of Commander-in-Chief of all British Forest troops during the war, had become fully

alive to the situation, and supported by appropriations from Parliament, based upon a ten-year budget system, the British Forest Commission began to function almost immediately after the passage of the act. Because of its singular position as an individual body responsible only to the Ministry and Parliament which created it, operations have been exceptionally free from internal disputes and the delays of governmental red tape. Hundreds of new nurseries have sprung up in England, Wales, Scotland and Ireland, and under an arrangement with the Crown forest authorities who originally controlled the great forest parks of Windsor, New Forest and simi-

lar districts the already established nurseries of the whole country have been drawn upon for more than sixteen million seedlings. Nearly every section of the United Kingdom now displays many acres of healthy tree plantations.

Under Parliamentary instruction the committee does not stop with the replanting of the forests cut during the war, but has made a scientific study of the utilization of those miles of waste lands along the sea and amid the Scottish heath which have hitherto been almost entirely unproductive. The downs and moors of England have always played a large part in the poetry and romance of the nation, and it is significant that now, for the first time, they will figure in its economic reconstruction. Forest lovers will appreciate that this utilization of a portion



ALONG THE ROUTE OF THE CALEDONIAN CANAL

This famous waterway is well known to us through its use during the war as a short cut for American submarine chasers. The bare and hitherto unproductive hillsides are being converted into forests of pine, spruce and fir.

of the heath lands will not in any way destroy their old beauty and charm.

We think of England's great commercial tree as the oak, not only because of the spirit which it typifies, but also because of the great skill of the English lumberman and wood worker in adapting it to the requirements of the home; and more than any other nation in Europe England is a country of homes. Oak, however, is a slow grower, and in the Scotch pine, which is a member of the European common pine family, European larch, and spruce, lies a more readily realizable value. This does not mean that England's great oak forests will not be reconstructed and amplified, but that the conifers are more suited to the poorer soil and produce common lumber for all more general purposes. England's greatest natural resource is of course her coal. It has for years been the one natural product which she exported, as it were, in exchange for the food, cotton and lumber which she needed. The method of mining coal in England and Wales is by means of countless temporary tunnels which require to be shored up with poles. The commercial pit prop of England is a pole less than four inches in diameter at the small end and varying from five feet in length upwards. A pine tree will last as long as the tunnel is needed and as pine is more rapid of growth it is much less expensive than hardwoods.

Another valuable tree in England is the American Douglas Fir, which in any but a very sandy soil, combined with the natural moistness of the



ENGLAND'S PREMIER COMMERCIAL TREE

A fine mature specimen of Scotch Pine in the old Crown Forest of Windsor.



THE SITE OF A NEW FOREST

Unproductive waste land near the East Coast of England which has been sown with French Maritime pine.

British climate, grows with such rapidity and strength as to almost outdistance its equally aged brothers and sisters of our Pacific Coast. In southern England as well as in Scotland young Douglas Fir seedlings are greatly in demand to replace some of the old, overworked, hardwood forests where the growth has become comparatively unappreciable. Where there are no forests to begin with, artificial planting of nursery grown seedlings is most generally employed, although recent experiments have been made with direct seeding, more particularly with that peculiar species of sand-loving pine known as the Maritime Pine of France. One may see today along the downs of eastern England near Ipswich, great stretches of heath dotted with tiny Maritime Pines sown there with little care and fairly glorying in an almost moistureless soil.

Judging only from efficiency of operation and practical results, the success of Britain's new forest policy should be definitely assured, but unfortunately the criterion of accomplishment alone does not today afford the basis of real success or failure. Particularly amid the present world-wide demand for re-trenchment in all government as well as private expenditures, only a widespread and continued public appreciation of that success and

the benefits to be derived therefrom can guarantee the continuance of the essential appropriations or subscriptions. That the British public is generally ignorant of the splendid work that is being done for them by their Commission is a serious misfortune, and

Continued on
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TREE PLANTING OPENS ARMISTICE WEEK

WITH a simple ceremony the American Forestry Association marked the opening of Armistice Week by the planting of two American Elms at the head of what is to be International Avenue on the grounds of the Lincoln Memorial in Washington. The trees were planted on Monday morning, November 7. Mrs. Warren G. Harding placed the first earth about the roots of the tree for the Allied Armies. The other tree is for the Allied Navies. Charles Lathrop Pack, the president of the Association, made a short dedication speech. Lieut. Col. C. O. Sherrill, in charge of public buildings and grounds as well as aide to the president; Captain Holmes, naval aide to the president, and Miss Laura Harlan, Mrs. Harding's secretary, were present.

There was an invocation by Col. John T. Axton, chief of chaplains of the United States Army, after which Mr. Pack made a short address. He was followed by Capt. John B. Frazier, of the United States Navy, who pronounced the benediction. Col. Axton asked a blessing on the American Forestry Association because of the

work it is doing and touched upon the inspiration for brotherhood in Col. Sherrill's idea for an International Avenue of memorial trees to be planted by the world governments at the limitation of arms conference. The chaplain prayed "that the job that had long lain on God's Work Table for man to do must now be done."

In dedicating the trees, Mr. Pack said:

"Next Friday there will be convened at the call of President Harding a conference of world wide import. Representatives of the governments of the world will take up the question of limitation of armament following the close of the most terrible war history has recorded. On that day the unknown dead will be honored. We come here this morning to mark the opening of Armistice Week by planting living memorials as a sign of our faith that the idea behind the call of our President will live. These Armistice Elms are to stand at what will be the head of the International Avenue of trees to be planted by these world governments.

"The Elm is inseparably connected with the past and



THE ARMISTICE DAY TREE PLANTING

Mrs. Warren G. Harding planting the trees at the entrance to International Avenue approaching the Lincoln Memorial at Washington, D. C., and President Charles Lathrop Pack, of the American Forestry Association, presenting the trees and reading the dedication address.

present of America. With Elms, the earliest forefathers sheltered their cabins: Under an Elm, George Washington assumed command of the Continental Army. On the side of sentiment, the Elm has filled the eye and heart of countless children, men and women in America. Truly the native American Elm is a native born American citizen.

"With its erect pose, it stands always at soldier-like 'attention.' Consequently, it is a fitting monument to the cause of so arranging world affairs that the sons of you men of the American Legion may be spared the hell which you yourselves so bravely and so nobly entered.

"The cause is an appeal to sanity. It is an appeal to save your sons, for if the world again should go mad, your sons, true to their inheritance, faithful to their duty will step into the flaming path which you yourselves have trod.

"For such an avenue this is a fitting spot—the memorial to Abraham Lincoln. Look about you and see him. He and the United States are identical. He and you

men who fought are identical. He and the cause of the plain people for which you fought are identical. He, Eternal Truth, and the cause we mark today are all identical.

"Accordingly in this city where he died and here before his formal memorial we dedicate these trees, native American Elms, dedicate them to the cause of world brotherhood and eternal peace. Therefore, as a representative of the American Forestry Association and in its behalf, I request the American Legion to place these living memorials."

After Mrs. Harding, Mr. Pack and members of the American Legion Posts in the District of Columbia had placed the earth about the trees a bugler sounded "Taps." Immediately after the ceremony Mrs. Harding's trowel and the trowel used by Mrs. Medill McCormick at the tree planting on the Association's grounds last Spring, were sent to the Chicago Tribune for use in Chicago on Armistice Day, when the American Legion planted several miles of a Road of Remembrance.



GENERAL PERSHING PLANTING A TREE IN HONOR OF THE FRENCH DEAD
An American oak planted on October 19, 1921, in the Trocadero Gardens in Paris by the commander in chief of the American Armies will symbolize America's sympathy for the sons of France who gave their lives in the war.

EDITORIAL

THE SUPPLY OF PULPWOOD

OUR neighbors to the north have quite a sizeable woodpile left according to recent estimates of the Canadian Commission of Conservation; yet the talk of a shortage goes merrily on. Nothing is inexhaustible which is not continually renewed at least as fast as it is used, so some day there must come an end to the virgin pulpwood timber as there has to Michigan white pine. But if the figures are correct our newspapers need not be printed on fibre from grass or bamboos or carved on stone tablets for some time to come.

The Conservation Commission's estimate of actually available pulpwood in the eastern provinces is 306,000,000 cords, while accessible and inaccessible is placed at 501,000,000 cords. In the whole Dominion the most recent estimate is 901,000,000 cords. The divisor for this is five million cords, representing annual consumption, including the 35 per cent exported to the States. This gives a sixty years' supply of available wood for the East and one hundred and eighty years for all Canada if all is ultimately used. Even allowing for increased consumption and fire loss, and assuming that our Canadian friends will continue to share the product of crown (freehold) lands with us, there is enough to maintain a healthy balance of trade and feed their own paper machines for probably half a century.

In the meantime, what? Will effective forestry be established by then and the fire menace curbed, or will the supply be ruined and burned and come to an end? As for the United States, will the Underwood Commission have functioned futilely and its report filed and forgotten, or will be getting wood from the licensed provincial limits from which export is now prohibited? Perhaps the reverse will happen and an embargo or export duty placed on the raw material from Crown lands, as is so ardently desired by a few Canadians. If this happens our own fast growing resources of southern pine, particularly loblolly, may come into their own more promptly and processes perfected for the conversion and bleaching of yellow pulp. Should this happen, Canada might find herself with an over abundance of pulpwood timber wealth. In 1920 we paid Canada the neat little sum of \$191,000,000 for pulp, pulpwood and paper.

All agree that a timber census is essential for the formulating of wise plans and policies, but unless the knowl-

edge is more complete and detailed than any yet at hand, many inconsistencies and uncertain or variable factors remain. In considering the supply of standing pulpwood timber the arch forest enemies of fire and insects must be reckoned with. Neither is under control. On one large tract in Quebec fire in May and June this year killed the timber on over forty per cent of the area, and its damage and extent was greatly increased by the dead balsam killed previously by the bud worm. In the remote north country most fires are caused by lightning, and if thirty mile belts have been fire swept in the past they are likely to be in the future despite all human precautions.

If figures do not lie, Canada has pulpwood for several generations, so why worry? The general opinion is, however, that somebody should worry and that dividing the apparent supply by the consumption does not give the right result. It is said that there is not a well timbered and otherwise desirable pulpwood tract of large size available for purchase on or directly tributary to the St. Lawrence River. If true, it means that a large part of the available one hundred and fifty-five million cords in Quebec is held by strong owners as a long time supply for their own mills, and that the new field, whether Government limits or private, is back in the region of long drives and low stand per acre. And the same statistics show that only eighteen per cent in Ontario and fourteen per cent in Quebec is privately owned, which means that most of this great pulpwood domain has not been considered good enough or accessible enough to be taken over by private owners. Accessibility and ownership, therefore, become potent factors.

Despite the interesting estimates of the Conservation Commission, we come back to the glittering generality that Canada has an enormous forest wealth in spruce and balsam pulpwood; that she is quite cognizant of its value, both for her own industries and for export; and that the United States may get more or less of it according to the political and economic developments of the future. A few Canadians want to keep all of it, the majority are inclined to the status quo or to reciprocal arrangements for the development of trade. All would like to encourage protective measures and forestry practice which will ultimately perpetuate the supply.

ELECTION OF OFFICERS FOR 1922

Inasmuch as a number of changes in the by-laws of the AMERICAN FORESTRY ASSOCIATION have been proposed by a joint committee of officers of the Association and of foresters, it has been decided to postpone the election of officers for the year 1922 until a special election date after the annual meeting in January, 1922. This will enable the Association to elect officers under the provisions of the by-laws as amended at the annual meeting in January. The proposed revision of the by-laws will be published in the January, 1922, issue of American Forestry.

The Lure of the Black Hills

Earl Emmons---The



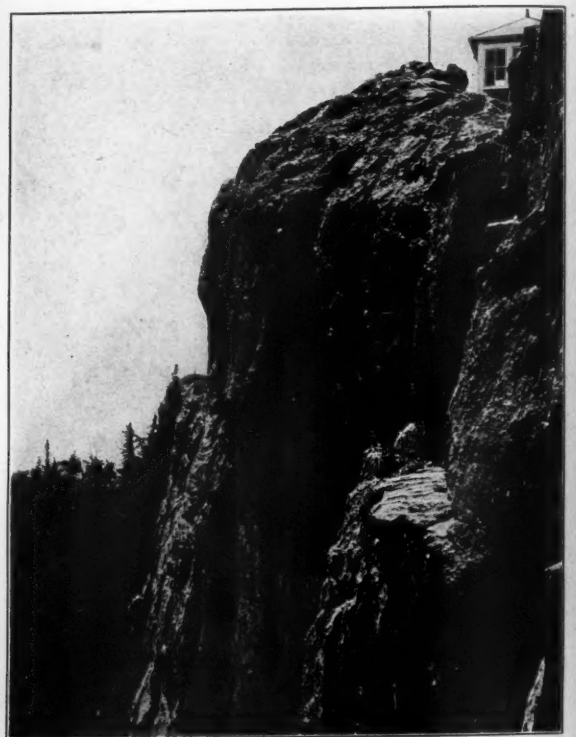
SYLVAN LAKE IN THE BLACK HILLS

*Shimmering jewel, as crystal clear,
Clearer, methinks, than an Angel's tear
Held in a setting of peak and pine
Wrought by the hand of the Great Divine.
Deep as the love in a woman's eyes,
Mirror of Nature serene it lies
Flashing reflection of hill and brake—
Gem of the Black Hills—Sylvan Lake.*



THE WONDER OF THE BLACK HILLS

*Oh pa-ha-sa-pa, God was doubly kind
When you He made, with all your wondrous charms;
Your tow'ring peaks with bounding plain behind,
Your sparkling streams whose far outreaching arms
Embrace a wealth of beauty vast and rare,
Of rugged canyons, gushing streams and rills,
'Neath azure skies and sweetly scented air—
A Nature's Paradise—the Great Black Hills.*



HARNEY PEAK OBSERVATORY—7240 FEET HIGH

*Lord of the heights and the circling space,
Monarch of peaks and the distant plain;
Lifting a lofty and rugged face
High over all in a calm disdain.
Holding a vision of four fair states,
Scorning the gale and the lightning streak;
Gazing serene into Heaven's gates
Crown of the Black Hills—Harney Peak.*

By One Who Knows Their Spell

"Poet of Harney Peak"

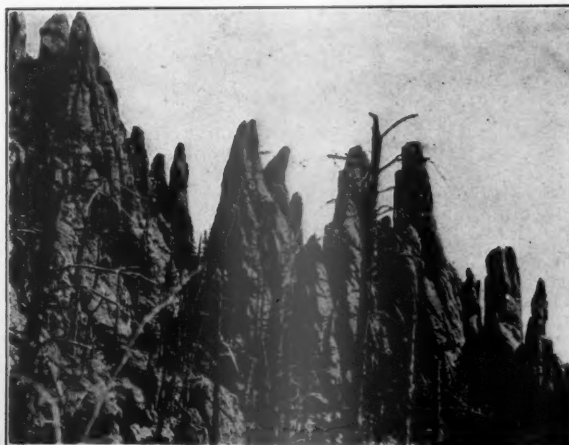


"GUARDIAN OF THE POOLS" AT SYLVAN LAKE

*Ah, Frozen-face, with melancholy pose,
With cold, sarcastic smile and deadened eye;
What means that stubborn jaw and upturned nose?
Why show such gloomy face—I ask thee—why?*

*Oh why so silent-lipped and sternly grim?
How can thy eye remain so chill and dull?
What seest thou beyond yon distant rim?
What secret thoughts lie in that granite skull?*

*What soured thy disposition, Pompadour?
The world is not so hopeless as it seems;
Come on, don't be a pessimistic bore—
Brace up and grin—forget thy grouchy dreams.*



THE NEEDLES OF THE BLACK HILLS

*Stately and grand in a row they stand,
Cloaked in a somber hue,
Shaming the pines with their slender spines
Piercing the azure blue.
Silent and gray in a vast array,
A vision that awes and thrills;
Holding sublime in contempt of time—
The Needle Rocks of the Hills.*

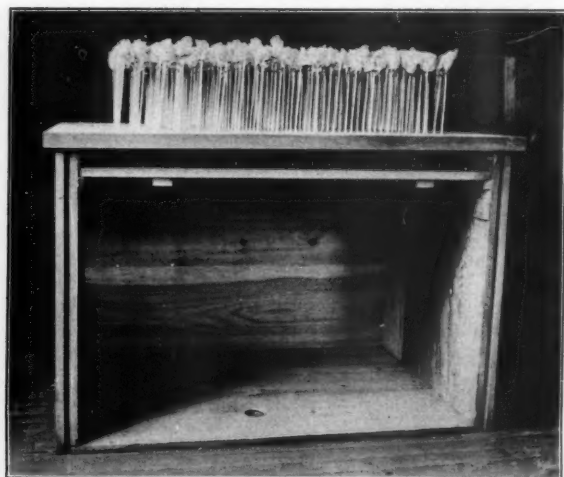


"THE WHITE RIVER"—BAD LANDS

*Ghastly and weird with your jagged peaks
Bleached to the color of dead men's bones
Gloomy defiles where the wild wind shrieks
Hideous menace in ghostly groans.
Nakedness slashed with a bloody red;
Caverns where demons alone could dwell;
Land of despair and of things long dead—
Bad Lands, forsooth, and an unlit Hell.*

THE PENN STATE DEMONSTRATION FOREST

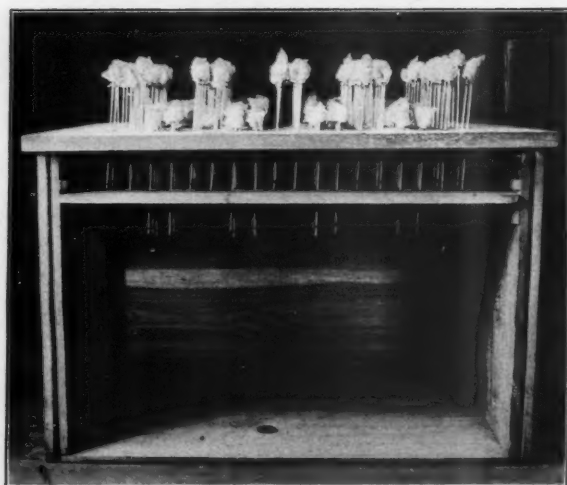
BY J. A. FERGUSON



EVEN-AGED FOREST



UNEVEN-AGED FOREST



ALTERNATE STRIP CUTTING

FEW if any forest schools in the country are so located that students can be taken to the woods to see carried out practically or ideally the various methods of cutting forests to secure reproduction. Photographs and lantern slides of forests managed by different silvicultural methods are of value in instructing students, but often fail to present the methods clearly.

The author has felt for some time the need of a mechanical demonstration forest by which the different methods of cutting could be shown to students. Such a forest has been devised and has proven workable. As shown by the photographs the apparatus consists of a heavy table perforated with holes through which dowel sticks with sponges representing trees are able to move freely. This table with its back and sides in box form can be moved up and down over a similar three-sided box form, inverted. On the sides of this latter form, cleats are nailed on which shelves can be placed. When the table is lifted the trees are lifted by the sponges. When high enough a solid shelf can be placed on the top cleats. When the table is then lowered the trees will strike this shelf and rise through the table, presenting the even-aged forest shown by the photograph.

A second shelf through which holes have been properly bored can now be placed on a lower shelf. When the top solid shelf is withdrawn the trees will fall to the second shelf, some of them passing through the holes. If holes are bored to represent an alternate strip method of cutting the result is illustrated by photograph. Other shelves can be used to show the different methods of cutting forests. By means of a series of shelves arranged at different elevations an uneven-aged forest can be developed. The demonstration forest can also be used to show methods of thinning forests by using shelves having holes closed by cardboard or metal disks which can be controlled, allowing the trees to be thinned out to fall through. The normal forest can also be shown by means of a series of shelves with properly located openings.

FORESTS OF LITHUANIA

WITHIN its present borders, Lithuania has nearly two million acres of forest land of which 46 per cent is the property of the state, says the Bureau of Foreign and Domestic Commerce in a recent consular report. The principal woods are pine and fir. About 60 per cent of the production of the State forests is consumed in the country and 40 per cent is available for export. In general, Lithuanian timber is considered a high quality. Many of the forests consist of trees of comparatively great age—pines 120 years old, firs 100 years old and oaks that have stood from 150 to 400 years. About one-half of the 6,750,000 acres of forest within the former boundaries of Lithuania belonged to the estates, and nearly all the rest to the Russian crown.

BERRY-BEARING PLANTS

BY F. L. MULFORD

ALTHOUGH to the unobserving the winter landscape may seem dull and uninteresting yet to one who has learned to see there are many beautiful and interesting things even when the leaves have all fallen and the grass has turned brown. Were we of the east as enthusiastic about the place of our abode as our western cousins we would sing the praises of the rich browns of the winter fields, the grays, browns, yellows and reds of the winter stems, and the deep greens of the winter foliage of our evergreens be they coniferous or broad-leaved instead of taking all as a matter of course or what is more likely never seeing these things at all.

Especially on the small grounds of the modest home are these items of the greatest importance, because here the members of the family are brought into close contact with every detail so that if there is any tendency to observe at all these various characters are seen. Of course every well-planted home lot has in addition to the flowering shrubs of spring and summer some evergreens to give winter cheer but not so many as to make the place look too penned up. Then too the different colored barks show with greater contrast against a background of evergreens. But in order to really attract attention to the beauties of the out-doors after the leaves have gone it is desirable to use some of the winter berry-bearing plants to halt the hurried passerby and hold him long enough to really see the things that are about him.

For example a bush filled with bright red berries after the leaves have gone will attract and hold the eye long enough to set the person to thinking and make them realize that there is something worth while to be seen in the humdrum of his life and before it is realized the beauties of the surrounding plants have found their way into his recognition. But to the home lover such added bits of color are a continual source of satisfaction and when appropriately placed add greatly to the beauty of the home surroundings.

Plants with bright red berries are those that are most showy and so are the ones first noticed and first considered in making plans for planting berry-bearing plants. Of the red berries plants probably the high bush cranberry (*Viburnum americanum*) is one of the best-known of our natives, especially in the northern states. There is a European form of the same plant (*Viburnum opulus*) that is not so attractive in fruit although it too is worthy of planting and in fact is not far behind the American form in ornamental value. These plants are especially valuable in the northern part of the United

States although they do well nearly all over the country. The European form is the parent of the common snow-ball. The high-bush cranberry has foliage that seems less liable to mildew than that of the snow-ball and has the added attraction of berries well into the winter. As other food becomes scarce birds are apt to eat these berries so that they are gone before spring and often early in the winter. The plants attain a height of eight feet. Next in importance of the red berries is the barberry. A few years ago these were best known in New England by the so-called common barberry a plant introduced from Europe, but that has become naturalized over much of New England and in many other states. This plant is now outlawed because it harbors the wheat rust fungus which does so much damage in wheat-growing sections of the country. Its near rela-



HIGH-BUSH CRANBERRY
(*V. opulus*)

A fine, strong plant and very popular. The fruit hangs on all winter, and in Canada is often used for jam.

tive, the Japanese barberry, has not acquired this habit of keeping bad company and is an even more attractive plant than the common barberry. Its berries are somewhat smaller and do not swing quite so freely and gracefully from the stems, but they are more plump and solid and remain on the bushes much longer. The birds do not eat these berries as a rule until other food becomes scarce. These plants form small to medium-sized compact masses of prickly stems covered with small leaves bronze and pea green when young, changing to dark



COMMON BARBERRY
(*B. vulgaris*)

A shrub growing eight feet high, with graceful arching branches and long clusters of red fruit.

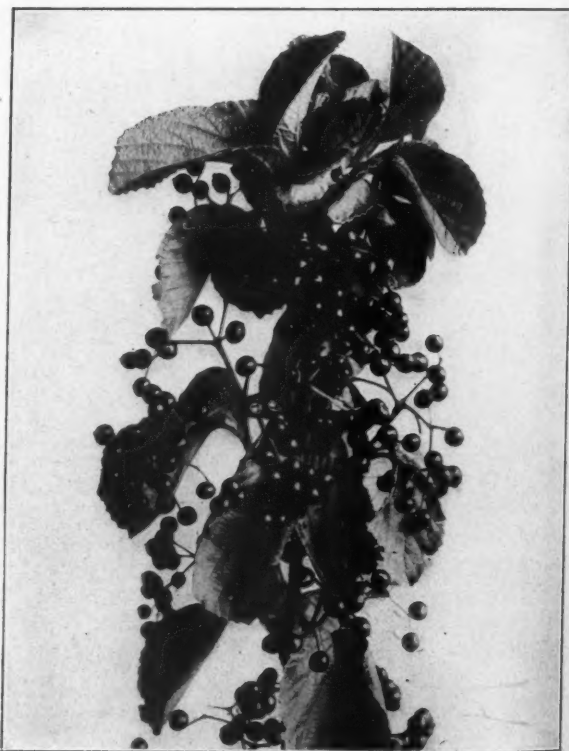
green when mature and turning a brilliant red in the fall. These plants attain a height of four or five feet.

The flowering dogwood that is so common in early spring all through the eastern half of the United States is also attractive all through the fall and early winter because of its abundant large red berries. The especially attractive arrangement of the branches of this tree in layers adds to its appearance at this season of the year as well as in spring and summer. It will eventually attain a height of twenty or thirty feet, but because of its slow growth it can often be used where a tree fifteen feet high is desired. Both the red and the white flowered forms are free fruiting. Its foliage also is an attractive feature in the autumn landscape as it turns a beautiful red before dropping.

For the northern half of the country especially, the mountain ash is another attractive small tree that has deep orange berries well into the winter. They also have white flowers in early summer. The foliage is also attractive, being a dark green and much divided. The most common one in cultivation is the European species (*Sorbus aucuparia*), but the American one (*S. americanum*) is better except possibly along the New England coast, where the atmosphere is particularly moist. This latter is not generally carried by nursery men and so is more difficult to procure.

The southeastern section of the United States has an-

other most handsome group of plants that are evergreen as well as having berries that hold all winter. These are the hollies, of which some thrive along the coast as far north as Boston. The largest and handsomest of these is the American holly, that is native as far north as Long Island and grows in protected places throughout southern New England, and as far north as Cincinnati and St. Louis. This is a handsome plant that eventually makes a large tree, but because of its comparatively slow growth may be used to advantage where an evergreen is needed that attains a height of twenty feet in the northern limits of its range. This plant has the two forms, the berry-bearing and those that do not bear berries. The practice of grafting these plants in order to insure the berry-bearing form has not been adopted by nurserymen, the practice being more common to wait until the trees are old enough to fruit and then selecting the berry-bearing form. These will not fruit without there is a staminate tree near. This means that in a community where there are not already a number of hollies the planter must be sure to secure both kinds. Because of the scarcity of these plants in nurseries and the uncertainty of being able to get just what is desired probably the sensible thing for the planter to do is to secure several small plants and make a clump planting wherever he is desirous of developing a tree and then gradually eliminating all but the specimen that he finds to have the characteristics he desires for the particular



JAPANESE BUSH CRANBERRY
(*V. dilatatum*)

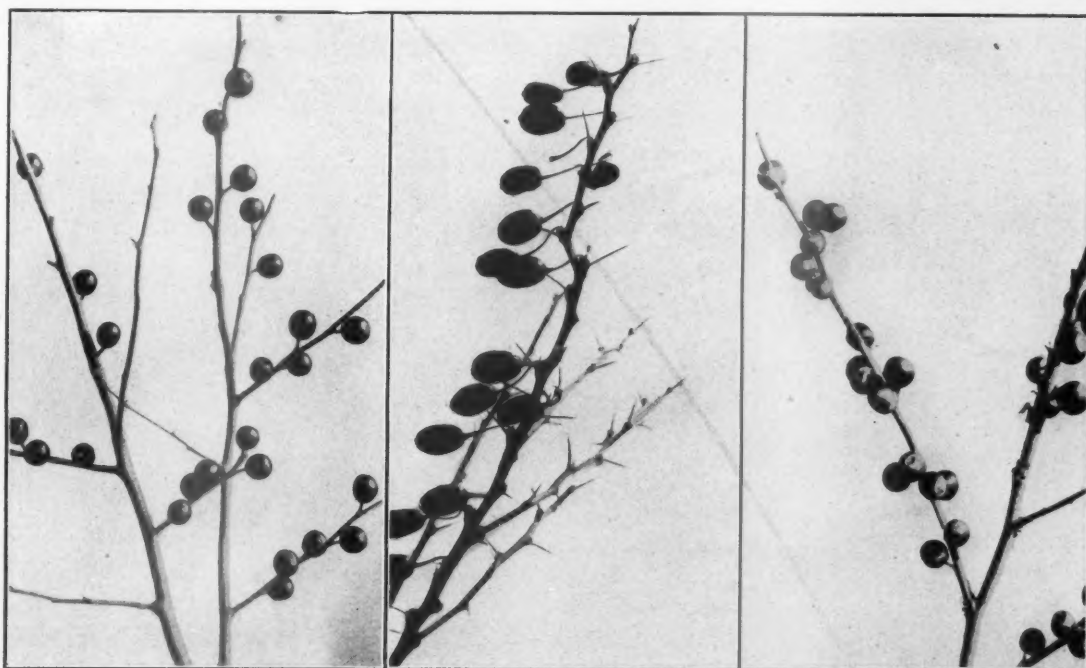
A very rare shrub that is brilliant red and holds its numerous red berries all winter. Usually grows about three feet high.

location. In addition to the American holly there is the English holly (*Ilex aquifolium*) that is also primarily a southern plant, but that is hardy as far north as Washington. It is not as hardy as the American holly. There are several varieties of the English holly with variations in habit of branching and especially in shape and texture of leaves, all of which are more glossy than the American holly.

Another showy holly is the black alder, a deciduous plant that has its stems almost completely covered with bright scarlet berries that turn by the middle or last of October and hold on well toward spring. In some communities it is spoken of as the Christmas berry. It, too, must have plants of both sexes in order to insure fruiting.

gins of the leaves. There are many other species that are good and hosts of others that have been described, that in any other genus of plants would be classed as horticultural varieties if they were recognized at all. The Washington thorn (*Crataegus cordata*) holds its fruit longer than many of the others. For most of the country the native thorns are better suited for ornamental planting than the European kinds, as the foliage keeps in better condition through our hot dry summers. There are also some evergreen species that are often planted.

Another group of small trees and shrubs that are showy in late fall and early winter is the euonymus. Here again there is a native species that is most useful and



BLACK ALDER, OR WINTER-BERRY

(*I. verticillata*)

This is the familiar red berry so often tied into Holly wreaths for the Christmas trade. The plant is occasionally found on Long Island, in upland hedge-rows and swamps.

JAPANESE BARBERRY

(*B. Thunbergii*)

This is a valuable shrub for edging down taller groups, because its thick growth holds the blowing leaves. It is used very extensively for hedges.

GRAY ALDER

(*Ilex laevigata*)

A member of the Holly family, this is covered with orange-red berries in the early fall. Popular for house decoration combined with evergreen leaves.

The flowers of all the hollies are inconspicuous.

For the south the yaupon (*Ilex cassine*) is an attractive shrub or small tree of rather upright growth. It fruits freely and is a useful plant for hedges as well as for more free growing effects. Its berries are also scarlet. It is native as far north as Wilmington, North Carolina.

Another large group of red fruited small trees are the thorns, among which the common cockspur thorn (*Crataegus crus-gali*) is one of the most satisfactory. It is beautiful in spring with its clusters of white and bluish flowers as well as in fall with its berries. Its foliage is also attractive throughout the summer, as it is of a good clean green made more attractive by the irregular mar-

ornamental that has been neglected in the past for a European species that is not as well adapted to our climate. The showy fruits of these plants consists of a purplish angular seed pod that ultimately splits open, exposing the orange or scarlet berry seed that hangs in the pod for quite a long time. On some of the species these fruits hang on well into the winter, especially in the north. The common burning bush or wahoo of our western states (*Euonymus atropurpureus*) is one of the good species, the berries being orange. The foliage turns pink and red in autumn and hides the berries until the foliage drops, but the fruits hang on well into the winter. The most common form in nurseries is the spindle tree (*Eu-*



AMERICAN HOLLY
(*I. Opaca*)

About the best known and loved of our Christmas evergreens. Two or three holly trees in a shady corner in the garden will be a source of pleasure all the year round.

onymus europaeus). The winged spindle tree (*Eunonymus alatus*) is a Japanese plant that forms broad bushes up to a height of twelve feet and is wonderfully prolific in fruiting, but best of all they hang on well into the winter. The branches of this plant are covered with wing-like protuberances of a corky nature that adds much to the winter appearance when seen at close range.

Another large group of plants that add brightness to the winter landscape is the wild roses, including some introduced species. Probably the most popular and most widely grown is the rugosa or ramanas rose (*Rosa rugosa*). This is attractive because of its heavy rough foliage as well as its winter hips that hang on well toward spring. The usual form has deep rose-colored single flowers while there is another equally good that has white flowers. Most of the named hybrids are lacking in the attractive winter hips that are so abundant on the species. In addition to this exotic species the native wild roses are most of them attractive in winter both for their hips and their bright stems. The hips are many of them even brighter than those of the rugosa rose and hold longer in a bright fresh condition. Among these are

the shiny-leaved rose (*Rosa lucida*) the Carolina rose (*R. multiflora japonica*), which has clusters of small white flowers followed by small bright red hips in clusters.

In addition to trees and bushes already mentioned there is a dwarf euonymus that is useful for a low under shrub growing from one to three feet high and bearing the characteristic fruits of this family. This is *Euonymus canadensis*, with orange berries. Another one of this family is a vine that can be used in place of English ivy and is hardy farther north than the ivy. This is *Euonymus radicans*, an evergreen plant that bears orange-colored fruits abundantly on the fruiting forms.

There are also two other vines that have showy berries, one is the false bitter-sweet (*Tecoma radicans*), that bears orange berries that are released from oval capsules in the manner that the fruits of *Euonymus* is released holding in the capsule for several weeks and making an attractive Thanksgiving decoration in those regions where it is native. The foliage is excellent, making the vine most useful where a vigorous dark foliage

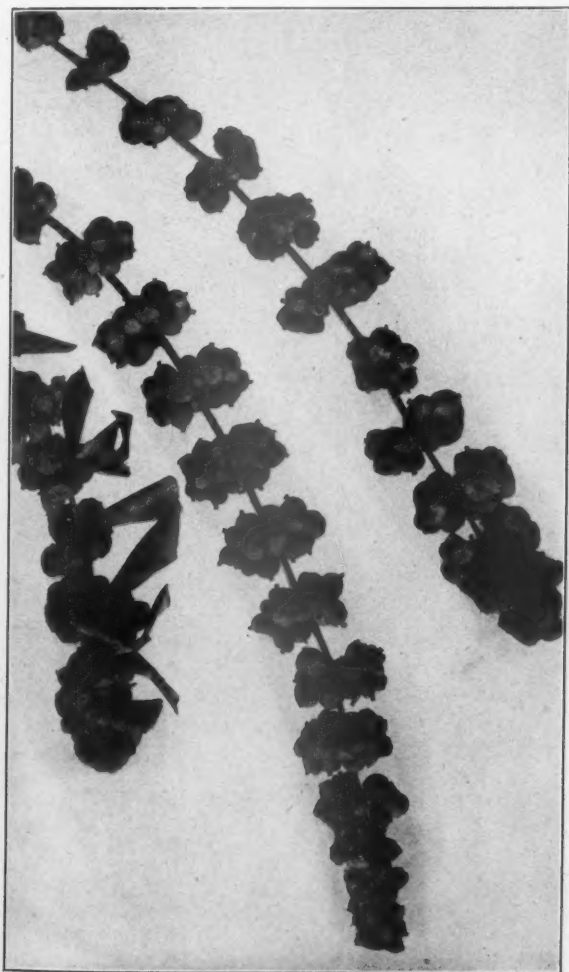


SILVER THORN
(*E. Umbellata*)

A taller growing species of the Japanese Silver Thorn, producing masses of red berries. It will grow twelve feet high and is a fine addition to any shrub border, producing winter feed for the birds and adding a bright touch of color when the leaves are gone.

plant is desired. The other plant is as often seen as a trailing shrub as a vine, but is useful in either way. It is the matrimony vine (*Lycium chinensis*) and bears two crops of berries a year, one ripening in June or July, and either dropping soon or is eaten by birds, while the other ripens in September and October and holds on most of the winter. The foliage of this is paler green than that of the bittersweet. It is native of the Orient, while the bittersweet is one of our American plants.

In addition to the bright red winter berries there is a plant with purplish red berries that is native all over the country. This is the coral-berry, some times called "Indian currant," known in the west as buck-bush (*Symphoricarpos vulgaris*), and is even listed sometimes by nursery men as "red snow-berry." It spreads by the rooting of the tips of the branches and its whole habit of growth is a little less trim and finished than many of the plants mentioned. On the other hand, it holds its berries well into March, even southward into the Carolinas and is a most valuable shrub for winter effects where a plant under five feet in height is desired. It is



SNOW-BERRY
(*Symphoricarpos racemosus*)

This is an old-fashioned shrub with large pure white berries, growing usually about three feet high.



JAPANESE TURQUOISE BERRY
(*Symplocos paniculata*)

Here is indeed something new—berries as blue as robins' eggs! It is a rare and lovely shrub and in September and October is loaded with berries, which the birds quickly demolish.

hardy and naturalizes well.

The Callicarpa, also called sometimes calico bush (*Callicarpa purpurea*) is another of our native plants that is a valuable ornamental. It has clusters of small berries at the tips of the branches like the coral-berry, but they are regular in size instead of having large ones and small ones all crowded together in a close bunch as does the plant just described. The callicarpa is tender north of Philadelphia except in favored locations, but is a valuable addition to the list of berried shrubs for places farther south.

Although stress has been laid upon the scarlet and orange-colored berries those plants with black berries also have a useful place in the winter landscape. Of course those berries with more or less of red in their coloring can be seen for greater distances than those of quieter hues and for that reason are approximately more largely considered when planning the winter picture. On the other hand the black berries are also attractive

and when silhouetted against the sky or with snow as a background they are especially noticeable.

Among the plants with black berries the privets are probably the most common in cultivation. All the privets that are permitted to grow in a sufficiently natural manner as to bear flowers will also set an abundance of berries. With the severe pruning to which the privets are usually subjected there is little chance for them to bear their dainty but beautiful flower clusters. The berries are borne in clusters well above the foliage as a rule. Many do not realize that the privets are good for anything but hedges, but they make beautiful shrubs when permitted to grow without being mutilated by the pruning knife. They vary in height from six or seven feet to nearly or quite thirty feet.

Some of the other plants with black berries are Viburnums like the arrowwood, which is a native shrub growing about six feet high that in spring is covered with clusters of small white flowers followed by clusters of blue or blue-black berries that hold on well into the fall. The black haw (*Viburnum prunifolium*) is another though larger shrub that holds its blue-black berries well after frost. This shrub attains a height of fifteen or twenty feet, but has flowers similar to the arrowwood and like it is a handsome plant when in full bloom. They both flower in late spring. There are a number of other Viburnums

with blue-black or pinkish berries, but they ripen and fall before winter really comes.

The white kerria or rhydotypus (*Rhodotypus kerrioides*) is a shrub that bears shiny jet black berries singly all over the bush and they hold on until the next year's foliage is well advanced. The flowers are white and about the size of those of the philadelphus or (mock-orange of the northern states (*Genus Philadelphus*), although there are but four petals as contrasted with the five petals of the Philadelphus. Its foliage is wrinkled and a rather light green rather similar in general effect to that of the kerria.

The bayberry (*Myrica cerifera*) is a white berried plant that holds its small white fruit well into the winter. It is native on the light lands near the seacoast and in these situations it is particularly abundant. It is evergreen but the white berries packed closely along the stems are rather conspicuous and used in front of evergreens the effect would be pleasing. It is especially adapted to the coast regions and

lighter lands. Plantings on heavier soil should be made in an experimental way. In addition to the vines already

mentioned some of the ornamental grapes or ampelopsis, as they have been called at different times are valuable for their bluish berries that hold well into the winter. These berries on the most available form *Ampelopsis heterophylla* (*Pseuderaceta heterophylla*) are white and pinkish heavily



RED CHOKEBERRY
(*Aronia aubatifolia*)

This is a native shrub not often seen, laden with bright berries all winter long.

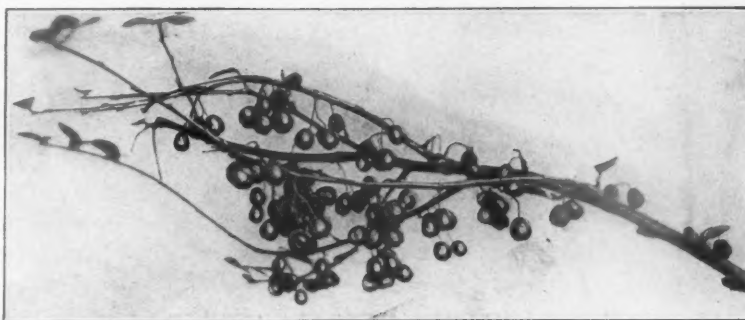


CHINESE CHRISTMAS-BERRY
(*Photinia villosa*)

This is often combined with the Chinese Turquoise Berry and the Japanese Bittersweet and they make a very showy effect in October and November. The berries are like those of the Cotoneaster and the Junberry, and feed the birds a long time.

overlaid with different shades of blue. They hold on the vine most of the winter. The foliage is a prettily mottled green with tinges of yellow and pinkish tints, but not sufficiently pronounced to be called variegated.

There are many other berry-bearing plants, some of which hold their fruit throughout the winter, but a large number of



COTONEASTER
(*C. divaricata*)

This is one of the newer introductions in berry-bearing plants from China. The shrub is particularly valuable for the scarlet berries which are produced in great abundance in the fall. The plant has a branching habit and grows about six feet tall.

provide food for the birds as well as ornamentation to the garden. The list discussed will give an insight into the possibilities for the northern gardens as well as suggestions of a few of the many good things available only for southern gardens. (Photographs by courtesy of Isaac Hicks & Sons Nursery.)

QUESTIONS AND ANSWERS

Q. Please advise us what kind of trees would produce the quickest shade that is adapted to this climate. Also when is the proper time to trim holly trees?

A. B. C., Pikeville, Tenn.

A. The trees that would grow the most quickly with you would be some of the poplars followed closely by the silver maple, but these trees are all of them so subject to injury by wind at an early age that their planting should be avoided in climates suited to the growth of better trees, such as yours.

Of the good trees for producing shade the American elm, the tulip or tulip poplar, and the red oak are probably the fastest growing. Other good trees of a trifle slower growth are the basswood, pin oak, scarlet oak, sycamore, and following this the red, sugar and Norway maples, with the white oak not far behind on soils on which it thrives.

The best time to trim holly trees is just as they are starting into growth in the spring, before the new growths are a fourth of an inch long. The time just previous to that is better than later, especially if much wood is to be removed.

Q. What trees should be used for planting a wind-break near San Francisco, California, on land 1,000 feet high 4 miles from the ocean and subject to strong ocean winds and heavy fogs?

L. R. D., San Francisco, Cal.

A. *Eucalyptus viminalis* has been largely used for wind-breaks on the peninsula south of San Francisco back of the ocean hills. On the ocean front the live oak also called coast live oak withstands the wind admirably. It would seem wise to plant several species together to mutually support one another and eventually partially or entirely remove the least desirable. Such a combination might be live oak, Monterey cypress, bay, Russian olive and *Eucalyptus viminalis*. The live oak is the best but is somewhat slow in growth. The other plants would grow more rapidly and although they might have part of their tops destroyed by the strong winds they would afford some protection to the live oak so that its growing tips would not be as likely to be injured as though it had no such protection, and thus its net growth per year would be greater. Close planting will also help by crowding the plants into upright growth.

Q. Can you give me a remedy to prevent the leaves on the buckeye or horse chestnut becoming yellow and dropping off so very early in the summer. I have a tree on my lawn that is

very beautiful. Just now foliage nice green, but in a few weeks the leaves in towards the center will begin to turn yellow and drop off and gradually work out to the outside and by the middle of July the tree will be bare of leaves. I would be pleased to have you advise me of some way to prevent this condition.

M. H. H., Pittsburg, Pa.

A. In response to your inquiry there seems to have been little investigation made of the disease of the horse chestnut and buckeye that causes the dropping of the leaves. It is probable that sprayings with Bordeaux mixture as used for fruit trees, applied the middle of May, the first of June and the middle of June would be helpful although there appears to be no record of control by this method having been carried out. Such treatment would be expensive unless the use of a spray outfit adapted for spraying street trees is available. The spray machines ordinarily used for orchard work are not powerful enough and are not equipped to throw the spray material into the top of shade trees.

Q. I am writing for information regarding the care of a Hemlock hedge. We have succeeded in getting young Hemlocks to grow around our yard, which we are endeavoring to form into a hedge, and I wish that you would kindly let me know about cutting them back, that is how far to trim them each season and what part of the year this had best be done. Also, regarding the mulching of the young trees; should the leaves that fall from surrounding maples be taken away in the spring, or should they be left around the base of the tree undisturbed? This is their second summer and the trees range from about 2 to 4 feet in height.

A. L. S., Alderson, Pa.

A. April is the time to trim hemlock with you in Pennsylvania, just as they are starting into growth. You can safely cut off about one half of the length of the branches covered with good foliage. You could do this on the larger plants and leave the smaller ones untrimmed or nearly so. Next year the larger plants could be trimmed back to the same point as this year and the smaller plants could be trimmed to a corresponding height. The plants trimmed this year will put out many side branches so that trimming them back next year to the same point as they were trimmed this year will still leave ample foliage on them.

LABELING THE CAPITAL'S TREES



LIEUT.-COL. C. O. SHERRILL

Who has charge of Public Buildings and Grounds at Washington, D. C. He recently received from President Harding the Distinguished Service Cross for valor in action at the Argonne.

FOLLOWING suggestions that the trees in the parks of the national capital be labeled so that visitors from all over the world who visit the parks may know them, Lieut.-Col. C. O. Sherrill, who has charge of Public Buildings and Grounds, has chosen a label. This will give both the common and scientific name of the tree, and will be a feature much appreciated by the thousands who daily go into these parks. The style of label and the plan of marking the trees might very well be adopted by other cities.

In describing the plan Lieut.-Col. Sherrill says:

"The label consists of a base, so designed as to be bent approximately to fit the par-

ticular tree on which it is used. On the face of this base is riveted a plate, upon which will have been previously stamped the botanical and the common names of the trees. The plate is then screwed with screws to the trunk of the trees sufficiently high up to prevent its being damaged by children and yet not too high to be clearly seen by persons interested in tree nomenclature.

"A number of different methods have been tried in the District for labeling trees, but none have ever proven entirely successful in that some became detached and carried away by souvenir seekers. It is believed that the size and weight of this label and the printing on the face, which clearly indicates the fact that it belongs to the Government, will deter souvenir hunters from carrying these labels away. If the plate containing the name alone, should be pried loose it can be readily replaced at very small expense. The screws used to attach the label to the trees are placed one above the other so that the growth of the tree will not pull them out, and it is believed that they will not do any damage to the tree. There will be a thousand of these labels put in position at the most necessary places during the present Fall.

"I desire to give Mr. Frederick D. Owen, the office architect and engineer under the Office of Public Buildings and Grounds, full credit for the work in designing this type of tree label."

Because of the great interest shown all over the country in the labeling of trees in the District, it is reasonable to suppose that many other cities will follow Washington's example and label their local trees. In many towns, especially throughout New England, there are trees of wonderful interest and historic value. Such cities might do well to adopt a similar label to that being used in Washington, the design of which is simple, dignified and beautiful, and at the same time, most practical.



LABEL FOR TREES IN THE PARKS OF THE NATION'S CAPITAL

SOME WOOD BORING INSECTS

BY FRED J. SEAVER, CURATOR, NEW YORK BOTANICAL GARDEN

OF all the destructive insects, the borers are the most obscure and difficult to control by artificial means.

This is due to the fact that they "dig in" and resort to "trench warfare," with the result that during the greater part of their life cycles the insects themselves are unseen, their presence being indicated by the external symptoms only. In some cases these symptoms furnish a very accurate index as to the nature of the trouble, but

following reasons: The active growing portion of the trunk of the tree is that just under the bark while the greater part of the wood below this serves merely to give mechanical strength, and, to a certain extent, as a water conducting system, and is not really essential to the life of the tree except as it serves to support the young branches and carry the leaves up where they can be freely exposed to the sunlight. Since the bark-borers often confine their attacks to the actively growing tissues, when abundant enough to surround the trunk they shut off the circulation of food materials and the entire tree or that portion above the point of attack is "girdled" and strangled.

The most of the destructive work is done by the caterpillar or larval stage while the adult which may take

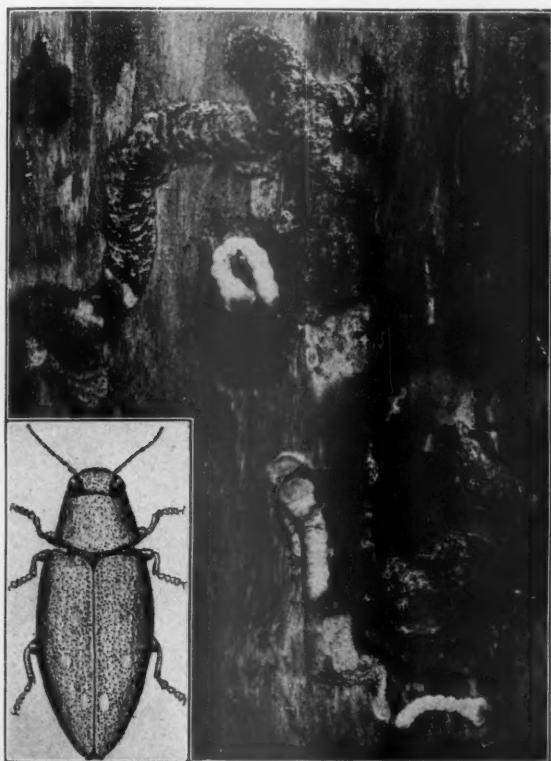


FIGURE 1. HEMLOCK WITH BARK PARTIALLY REMOVED SHOWING BURROWS AND BORERS, ABOUT NATURAL SIZE. ALSO AN ENLARGED DRAWING OF THE ADULT BEETLE

in other cases they are indefinite and often misleading, even to the expert. With a little experience, even an amateur can become familiar with the more common of the wood-boring insects whose ravages are too well known to many and of interest and importance to all tree lovers.

In a general way the wood-boring insects may be divided into two main groups, depending upon their mode of attack. The first of these is the group known as the "bark-borers" or those which work in or just underneath the bark, and the second, the "deep-wood borers," comprising those forms which penetrate deep into the branches or main trunk of the tree. While at first thought the bark-borers might be considered the least injurious, their work is often more likely to prove fatal in a short time than even the deep-wood borers for the



FIGURE 2. WORK OF THE RED CEDAR BORER, ABOUT NATURAL SIZE

the form of a beetle, butterfly or moth, often serves only as the egg laying stage and feeds sparingly. While the work of the caterpillar has been done in obscurity the adult emerges from its hiding place and is usually provided with wings in order to facilitate the process of mating. The adult stage is usually short lived, and, after mating and depositing the eggs, the female soon dies and the young caterpillars again "dig in," often spending one to several years in the larval stage before reaching maturity. While the adult usually feeds sparingly, in

some cases it eats voraciously and continues the destructive work of the larva.

The hemlock bark beetle (Fig. 1), one of the bark-boring insects, is the cause of a large amount of damage to the tree from which it derives its name. The caterpillar is a white grub with a large flat head and when full grown reaches a length of nearly an inch. The larva works just under the bark forming irregularly meander-



FIGURE 3. HICKORY BRANCH WITH BARK PARTIALLY REMOVED SHOWING EGG GALLERIES AND CHANNELS MADE BY THE CATERpillARS OF THE BARK BEETLE. DRAWING OF YOUNG CATERPILLAR MUCH ENLARGED

ing channels or burrows about a quarter of an inch in diameter and from a few inches to a foot in length. When the work of the insect is completed these burrows are filled with macerated wood resembling fine sawdust and if enough insects are present to girdle its trunk, the entire tree dies. The adult of the hemlock borer is a glistening bronze colored beetle about a half inch long and emerges from its hiding place in the spring through a hole in the bark. The only practical artificial remedy for this insect is the cutting of the infested trees to prevent the spread of the pest to those still uninfested. After cutting the trees the wood should be burned, or at least the bark removed and burned in order to prevent the cut trees from serving as sources of infection. This should be done during the winter and the bark disposed of before time for the adults to emerge in the spring of the year.

The red cedar bark-borer (Fig. 2), an insect similar to the preceding, works in the red cedar giving rise to the characteristic sculpturing which is often evident on red cedar which has been used for rustic work after the

bark has weathered away. Although the red cedar borer is thought to attack dead or weak trees exclusively, it seems likely, from our own observations, that this insect is responsible to some extent at least for the dying of this tree on estates and in our city parks. As with the hemlock borer, rustic work may serve as a source of infection for living trees unless the bark is removed and the insects prevented from maturing.

The hickory bark beetle (Figs. 3, 4) is one of the most destructive of all of the bark-boring insects and one which has received a great deal of attention in the last few years. The first evidence of the presence of this pest is the premature dying and falling of the leaves of the hickory in midsummer, about July or August. Inquiries as to the cause of this premature defoliation of the hickories are frequently received. The leaves may fall to the ground or they may be only partially detached and remain hanging in a dead condition, greatly injuring the appearance of the tree. If the fallen leaves are closely examined, a small cavity will be seen at the

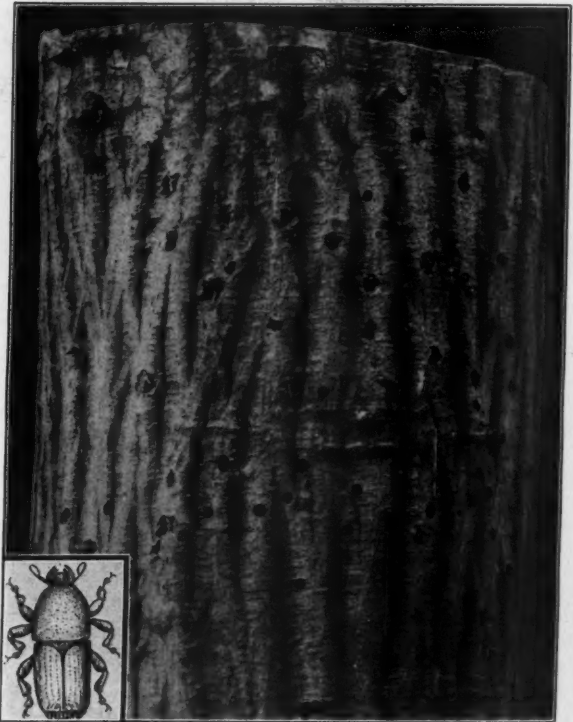


FIGURE 4. HICKORY BRANCH SHOWING HOLES THROUGH WHICH THE BARK BEETLES HAVE EMERGED, ABOUT NATURAL SIZE. THE DRAWING OF THE BEETLE ITSELF IS ENLARGED

base of the petiole. These cavities have been made by the adult of the hickory bark beetle which feeds upon the tender tissues at the base of the leaf so weakening the stem that the leaf is easily broken from the tree by the wind or partially detached as described above. If this insect would confine its attacks to the leaves and small twigs the injury would be comparatively slight, but unfortunately, they also attack the large branches or main trunk of the tree and it is here that the principal part of the damage is done.

After mating the female of this insect bores a hole directly through the hard outer bark of the hickory making a burrow about an inch in length, just underneath. This burrow is known as the egg gallery since the eggs are deposited on either side of the cavity and range in number from twenty to forty for each adult. The female usually dies soon after depositing her eggs and her remains can often be found in the old egg gallery. The larvae, small white grubs reaching a length of a quarter of an inch when full grown, hatch in a short time after the eggs have been deposited and immediately begin to work their way outward in either direction at right angles to the original cavity, each larva making a

moth. Its omnivorous habits render it more destructive than many of the deep-wood borers since it preys on almost all kinds of deciduous trees, especially the maples, lindens and ashes. Like many of the deep-wood borers this insect does not bring about immediate death by



FIGURE 6. BRANCH OF BLACK LOCUST HONEY-COMBED BY BORERS, ABOUT ONE-FOURTH NATURAL SIZE. PHOTOGRAPH OF CATERPILLAR AND BEETLE ABOUT NATURAL SIZE

separate channel which grows larger as they proceed outward on account of the increase in the size of the caterpillar. These burrows will explain the strange markings to be found under the bark of dead hickories. The larvae remain under the bark until the next spring when they emerge by eating their way through the hard outer bark, leaving it with the appearance of having been riddled with shot. The only artificial means of controlling this insect is similar to that proposed for other bark-borers, *i. e.*, cutting and destroying infested trees in order to check the spread of the pest.

The European leopard moth (Fig. 5), among the deep-wood borers, is one of the most destructive where it has become established, having, as its name implies, been introduced from Europe. The name "leopard" is suggested by the spotted markings of both the larva and adult



FIGURE 5. MAPLE BRANCH SHOWING BURROWS OF LEOPARD MOTH WITH CATERPILLAR, ABOUT NATURAL SIZE. DRAWING OF ADULT MOTH ALSO ABOUT NATURAL SIZE

girdling as is so often the case with the bark-borers, but its injuries are more indirect, resulting in a weakening of the branches through mechanical injury which, with the subsequent decay, causes them to be-

come disfigured and finally often broken from the tree.

The eggs of the leopard moth are deposited in masses of several hundred each in the crotch of a branch or in crevices in the bark. On hatching, the young caterpillars begin their work in the smaller branches, feeding on the plant tissues and rapidly increasing in size until at maturity they reach a length of two inches. When partly grown, the caterpillars leave the small branches where they begin their work and migrate to larger ones or in the case of a comparatively small tree, to the main trunk. Here each caterpillar excavates a cavity about an inch broad and several inches long just under the bark. It then begins to work toward the heart wood leaving a channel one-half inch in diameter and about six inches long. The writer has personally observed a partly grown caterpillar of the leopard moth in the act of boring its way through the solid wood into the main trunk of a silver maple.

After entering the tree the hole, through which the caterpillar has entered, is entirely concealed by a web which is spun for the purpose so that it is almost impossible to detect the presence of the insect except by the characteristic wood pellicles which are thrown from the burrow. This is usually done at night after which the opening is again closed.

It requires two years for the leopard moth to complete its life cycle. The caterpillar remains in a dormant condition during the first winter and resumes feeding the next spring, attaining its full size toward the end of the second summer. A second winter is passed in the larval stage and the next spring the pupae are formed near the entrance which later becomes the exit. The adult moth emerges in early summer, being most abundant in late June or early July. Being nocturnal in its habits the adult moth is not so frequently seen.

As previously stated, the artificial control of this insect is not easily effected. Some beneficial results can, however, be accomplished in the case of a comparatively young tree when the attack is in the main trunk or larger branches within easy reach. When its presence has been detected by the presence of the wood pellicles on the ground underneath, on account of the large size of the cavity the caterpillar can be drawn from its burrow by means of a wire provided with a hook or barb at the end. Or the caterpillar can be killed by injecting a poison, such as bisulfid of carbon into the burrow. While this might seem to be a rather crude or slow process, when we recall the fact that each adult female when she emerges is able to deposit several hundred eggs, the effectiveness of this remedy in checking the spread of the insect is more easily appreciated. After removing or killing the caterpillar the wound should be treated so as to prevent the decay which is likely to follow.

The locust borer (Fig. 6) is another deep-wood borer which is responsible for a great deal of damage, but fortunately, its restricted habits render it much less destructive than the preceding. The insect attacks only the black locust (*Robinia*), but here it is capable of such devastation that it has rendered impracticable the cultivation of this tree either for ornamental or for commercial purposes.

The keeping qualities of the wood of the black locust are such as to recommend its growth for various purposes where great resistance to decay is required, especially for railroad ties. Consequently one railroad company, a few years ago, under supposedly expert advice, planted more than two millions of seedlings to be grown for ties. In the course of a few years the entire plantation was ruined by the attacks of this and other insects so that the project had to be abandoned. Photographs of this plantation might easily be mistaken for those of a bullet-riddled forest from a European battlefield.

The adult stage of the locust borer is a large, beautifully striped beetle nearly an inch in length, the black wing covers with their yellow stripes giving them a very attractive appearance. It is a very active insect and may often be found flitting about goldenrods and other bright colored flowering plants where it feeds rather sparingly on the pollen from the flowers and where undoubtedly its own bright colors serve as a device to protect the beetle from being detected by its enemies. The beetle is short lived although apparently very optimistic and dies soon after completing the process of reproduction. After mating the female soon flies back to the locust tree where her eggs are deposited in the soft tissue just underneath the bark. The young larvae soon hatch and burrow into the wood where, unlike the leopard moth, they complete their life cycle one year from the time the eggs are deposited. The larva, when full grown, is a white grub about an inch in length and a voracious feeder.

The channels are about the size of an ordinary lead pencil. The wood which is chewed up, is passed through the body, the digestible parts taken out, and the refuse deposited in the form of rather coarse sawdust-like particles. This partially digested wood is thrown out in such large quantities as to form little heaps at the base of the tree when badly infested. The wood is often so thoroughly honey-combed by the grubs that the entire tree is distorted and the branches easily broken from the tree by the wind.

Since boring insects are difficult to combat by artificial means, it follows that we must depend largely on their natural enemies for their control. The most important of these natural enemies are the birds. Some one has said that the woodpeckers are the natural protectors of our forests and woodlands and certainly no bird is better equipped for warfare against boring insects. With its chisel-like beak, its sharp barbed tongue and its keen sense of hearing, it is sure death to the shallow boring insect. One block of hemlock about ten inches long and eight inches in diameter showed upwards of a hundred shallow holes made by woodpeckers in search of insects. Just how many were obtained it is difficult to say but knowing the habits of the bird it is safe to say that the work was not in vain.

While the woodpeckers go after the grubs the flycatchers prey upon the adult. Too much cannot be said in favor of offering protection and encouragement to our "feathered friends" upon whom we must depend very largely for protection against the ravages of the boring insects.

THE MOUNTAINS OF NEW ENGLAND

BY ALLEN H. BENT

(Photographs by the Forest Service)

IT seems to be generally recognized that playgrounds are necessary adjuncts to our civilization and that mountainous regions make the best playgrounds. Naturally the hill places within easy reach of the large centers of population are bound to be used the most; but the people who most need their health-giving ozone, their beauty, their inspiration, do not always know where or when or how to go. On one thing only are they agreed, that vacations, like sugar-coated pills, are easy to take.

As Switzerland is the playground of Europe, so the mountains of New York and New England form the principal playground for the dwellers in the busy cities of northeastern United States. The dwellers in our northwest are fortunate in having Mount Rainier and

conditions within easy reach. Emerson called Monadnock a "link in the Alps' globe-girdling chain". The White Mountains and the other heights of New England, are in the broadest sense a few more links in the same chain, but more specifically they are a part of the Appalachian chain, which begins with the heights of Alabama and Georgia and ends fourteen hundred miles to the northeast, with the Shickshock Mountains of the Gaspé peninsula. The name Shickshock has a sort of fascination about it and some day I hope to brave the hordes of black flies and mosquitoes that are reported to haunt the region and penetrate its fastnesses, for as every traveler up the St. Lawrence knows,

The mountains of Gaspé are fair to behold,
With their fleckings of shadow and gleamings of gold.



TYPICAL OF THOUSANDS OF SPOTS IN THE ADIRONDACK MOUNTAINS IN NEW YORK

This shows Whiteface, from Wilmington Notch. The forests comprise white pine, red spruce and hardwoods and the logs in the stream are white pine. Perfect recreation country in the East.

the other snow-covered giants of the Cascade Range for their holiday outings; but let us of the northeast be content with what we have—at least until the railroads lower their fares a little. In winter—and vacations at that time of year are rapidly increasing—we have Alpine

The Taconic Range along the western border of Massachusetts is the link that connects the Catskills of New York with the higher peaks of northern New England. Greylock—the Saddleback of earlier days—3,535 feet, in the northwestern corner of the state, is the highest

in the Commonwealth, and Mount Everett, "the Dome of the Taconics", 2,624 feet, in the southwestern corner, the next loftiest. Both are state reservations, are well supplied with roads and trails and are easily and profitably climbed. The first has a fire lookout upon it, the

second a small hotel. Bear Hill, the highest eminence in Connecticut, 2,355 feet, is only four miles from Mount Everett. The Taconic Range, which continues northward along the western border of Vermont for half the length of the state, has had its geological history minutely and interestingly

told by T. Nelson Dale, of the United States Geological Survey. The highest of the range, near the beautiful village of Manchester, where the sidewalks are of marble, the commonest rock thereabouts, is Mount Equinox, 2,816 feet, which probably has nothing to do with the sun crossing the equator, though it was first climbed about the time of the

autumnal equinox, in the year 1823. It is most likely an Indian name, Equanok.

East of Taconic Range are the Green Mountains, beginning with the hills of Connecticut and continuing through Massachusetts, the watershed of the Hoosatic and Connecticut Rivers.

On the hill tops of the latter state are the highest towns in New England, Peru, Windsor, Savoy and Florida (all over two thousand feet above the sea), recalling Dr. Johnson's lines:

Let observation
with extensive
view
Survey mankind
from China to
Peru.*

In Vermont there are four of the Green Mountains

over four thousand feet, the highest, Mount Mansfield,

*Massachusetts is not alone in its strange choice of names. Scotland and Lisbon join Canterbury in Connecticut; Berlin and Milan are side by side in northern New Hampshire; while among the hills of Maine, Norway, Paris and Oxford are grouped together, with Denmark, Sweden and Naples nearby, and Limerick in the offing.



A SECTION OF THE PRESIDENTIAL RANGE

This shows Mounts Adams and Madison from Glen Road, in the White Mountain National Forest, New Hampshire.



A PANORAMIC VIEW OF THE PRESIDENTIAL RANGE IN LATE OCTOBER IN THE WHITE MOUNTAINS

This beautiful range, the New England Highlands, culminates in Mount Washington, rising above its peers to a magnificent height of 6,293 feet. Some of the most perfect recreation country in the United States is found here.

4,364 feet, having a little hotel, built in 1858, near the top. The backbone of this mountain is a long, rocky ridge; but most of the mountains, as their name would imply, are covered with evergreen trees to the top. There are twenty-five summits between three thousand and four thousand feet. To connect these various heights the Green Mountain Club was organized in 1910, and soon there will be a forest trail along the entire chain from Massachusetts to Canada, 157 miles air line, which of course the Long Trail, as it is called, does not follow. It is very earthly and very woodsy and will probably be nearly 250 miles long, nor do the mountains stop at the northern border, they keep right on into the Province of Quebec.

The mission of the Green Mountains and of the state that has taken their name is to look pleasant, to cheer. Other states have Black, Blue, White and Ruby mountains, but Vermont stands by her color and invites the pilgrim to climb her green heights or rest by the way

Under the greenwood tree
And tune his merry note
Unto the sweet bird's throat.

In central Massachusetts, east of the Connecticut valley, is another ridge of hills, which after crossing into New Hampshire, sends up a well-known watch tower known as Mt. Monadnock, 3,186 feet. This range, in the main low, the watershed between the Connecticut and the Merrimac, continues northward sending up an occasional peak like Mt. Sunapee, the southern Kearsarge and Mt. Cardigan, until half way up the state near the headquarters of the Merrimac it breaks all bounds and increases greatly in height, forming an irregular mass, the White Mountains, roughly forty miles square and spreading out clear across the state. Beyond the White Mountains are still more mountains extending well into Canada, in fact the northern half of New Hampshire has very little level land. Somewhat north of the centre of the White Mountains the New England highlands culminate in Mount Washington, which rises a few hundred feet above its peers to a height of 6,293 feet. In the sixty miles from Randolph, at the north of the White Mountains, to the northern point of New Hampshire only two roads cross the state, nor are there many trails. A few have been opened up, namely, on the Pilot Range and Percy



ANOTHER BEAUTIFUL SCENE IN THE ADIRONDACKS

This is Heart Pond and Mount McIntyre from Mount Jo. It is typical forest—mixed hardwoods on the lower levels with balsam fir and red spruce on the margin of the pond. Ideal vacation land, set with jewel-like lakes.

Peaks near the White Mountains, and up some of the mountains around Dixville Notch, forty miles away. Dixville Peak is the highest of the latter group, 3118 feet, but the highest point of the road through the notch, which has some of the wildest rock scenery in New England, is 1990 feet.

From the eastern bounds of the White Mountains detached peaks, interspersed with many beautiful forest-surrounded lakes, continue to the northeastward through the state of Maine, to and across the Canadian border. The highest of these peaks, 160 miles from Mount Washington, Mt. Katahdin, 5273 feet, the most interesting and one of the most inaccessible mountains in New England. "Standing alone without society", taller by nearly a thousand feet than any other peak in the state and exceeded in New England by only half a dozen summits in the Presidential Range of the White Mountains, it is no wonder that it appealed to the solitude absorbing Thoreau and to all lovers of the wilderness before and since. Thoreau's ascent was made in 1846. Among other early climbers who have left interesting accounts are Professor J. W. Bailey of West Point in 1836, Dr. Charles T. Jackson in 1837, Rev. Edward Everett Hale in 1845, Theodore Winthrop in the fifties and Professor Charles H. Hitchcock in 1861. In the early years of the Appalachian Mountain Club, Professor Charles E. Hamlin and the Club's secretary, Rosewell B. Lawrence, did much to make the mountain better known and more accessible. In 1900 a small but notable party from the New England Botanical Club made an exhaustive study of its flora, publishing the results in their journal, *Rhodora*. One of the most interesting ascents was made on snow-shoes in February 1910 by Ralph Lawson and Percival Sayward, and the latter's account, in *Appalachia*, deserves high rank in mountaineering literature.

Although Katahdin is preeminent in its domain there are lots of other mountains in Maine, fifty-eight occupied in summer by fire lookout stations, for Maine's lumber industry is large and valuable, and needs protection. This means that there are at least fifty-eight mountains with good trails and extensive lookouts. A list of them will be found in the reports of the Forest Commissioner of the state. Unfortunately there is no adequate map of Maine, and the reports give no information about trails or altitudes. I doubt if anyone knows which is the second highest mountain in the state. There are several claimants, Speckled in the Border Mountains, Traveler Mountain twenty miles north of Katahdin, Parlin Pond Bald, north of the Dead River region, Saddleback near Phillips, east of Rangeley. These are all a little over four thousand feet probably. There is another Saddleback—called also Bald Pate and Bear River Whitecap—east of Grafton Notch, that may reach the four thousand mark. The first Saddleback with Blue, Abraham and Bigelow, are known as the Kennebec Peaks. Parlin Pond Bald, Baker, 3589 feet, and the mountains around Moosehead Lake are on the Kennebec watershed. Turner Mountain, east of Katahdin, is 3700 feet, and the Sourdnhunk Mountains to the west reach 3500 feet. Of the Boundary Mountains,

between Maine and the Province of Quebec, the highest seems to be Mt. Gosford, 3658 feet. Snow Mountain, a little south of the actual boundary, has a claim for 3800 feet. Deer Mountain, northwest of Gupsuptic Lake, is probably 3500 feet.

Taken all together it will be seen that in the four hundred or more miles between northwestern Connecticut and northern Maine there are many mountains, their dark forested slopes uplifted against the sky to cheer and inspire us. While the prevailing color is green for most of the year, except when distance robes them in an azure hue or sunset turns them momentarily to purple and gold, they have their white season, when they become a challenge to the mountaineer. Only when man becomes reckless do they wear sackcloth and ashes and become unlovely. Let us then preserve them in their virgin beauty.

CARDINAL'S CANE FROM FAMOUS TREE

THE Old Mulberry Tree at St. Mary's, Maryland, is bringing out new facts since it was nominated for a place in the Hall of Fame and its picture published in an earlier issue of *AMERICAN FORESTRY*. The following was taken from the *Baltimore News*:

"Cardinal Gibbons had a cane made from the wood of the old mulberry, presented him in the early nineties by General Bradley Tyler Johnson. General Johnson was the author of the "Foundation of Maryland," and some of his most interesting addresses were made before the Catholic Club, opposite the archiepiscopal residence on North Charles Street, now the official home of John Gardner Murray, of the Protestant Episcopal Diocese of Maryland. The president of the club, James R. Wheeler, of the First Maryland Cavalry, Confederate States of America, one of the closest personal friends of the Cardinal, and a number of its members had been soldiers in the Maryland Line under Johnson. The General, who came from Frederick County, was a keen student of early history in Maryland and a zealous defender of the Calverts. About the time the monument to Governor Leonard Calvert was erected at St. Mary's City, General Johnson secured some of the wood of the famous tree, and, after making an address on the old mulberry at the Catholic Club, was escorted by a party of his comrades to the archiepiscopal residence, where at a private reception by the Cardinal a cane made of the tree that is so intimately associated with Catholic Maryland was presented His Eminence for use in his strolls about the city."

THE wonder of the forests, their immensity and variety, their worth are to be considered as an ineffable appeal to conserve and restore and save. Help to perpetuate—talk forestry to your friends and let *AMERICAN FORESTRY MAGAZINE* show them the way to a better understanding and appreciation of God's great outdoors.

OUR GANNETS—SEA-FOWL OF UNUSUAL INTEREST

BY DR. R. W. SHUFELDT, C. M, Z. S.

(PHOTOGRAPHS BY J. H. GURNEY, F. Z. S., OF ENGLAND, AND THE AUTHOR)

THOSE foresters who have their homes and guard our forests along the Atlantic seaboard, from the coasts of Maine, southward, are often good observers of the oceanic species of birds, including such forms as are generally designated as shore birds; they come to recognize the gulls and the terns, and a big albatross when they see one, the man-o'-war-bird or frigate

pelican, the osprey, and not a few others.

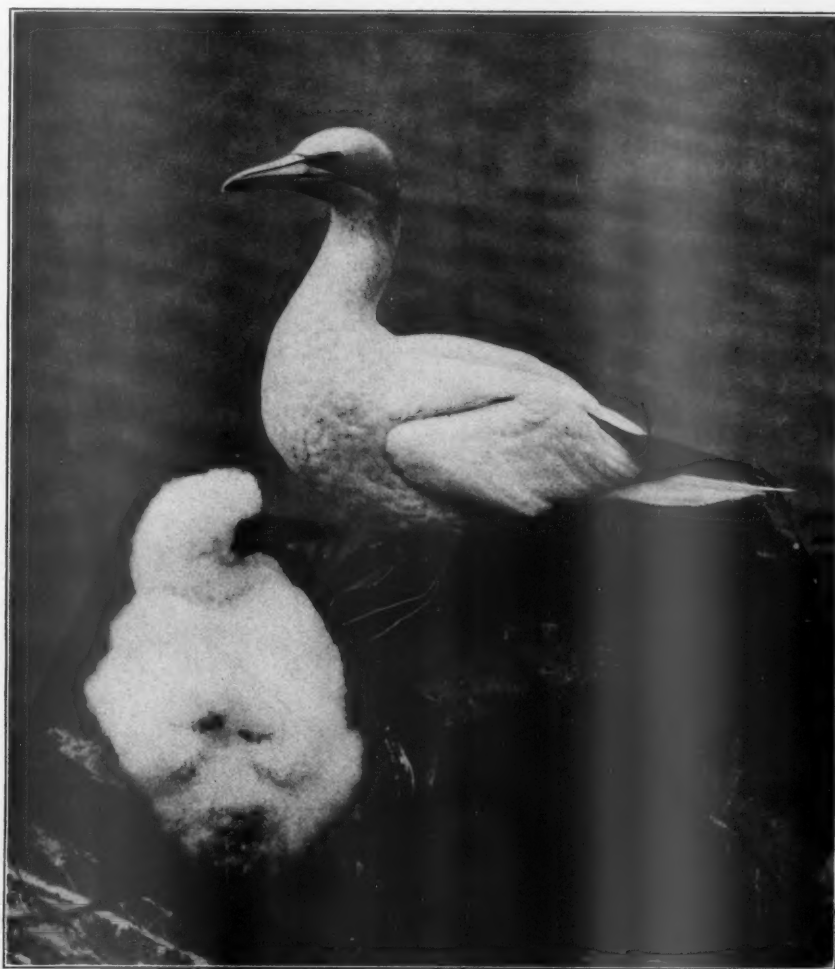
Now, I propose to describe here several other species of large sea fowl, which they are sure to see frequently, but with which they may not be so familiar, inasmuch as they do not breed on our coasts, although frequenting them during their migrations. These are the Gannets, which are large birds related to the tropic birds, to the Anhingas, to the Pelicans, to the Cormorants, and to the Man-o'-war bird, and we give the name of *Steganopods* to this group as a whole, which refers to the

fact that they all have fully webbed feet; hence, too, the vernacular name Totipalmate Swimmers. They are large birds, generally exceeding a couple of feet in length. In appearance and habits they are greatly at variance, although they do have quite a few characters in common besides the complete webs between the toes.

All are maritime forms, and all catch and subsist upon fish. Some of them, as the pelicans and cormorants, have a more or less strong hook at the end of the upper bill, and a bag-like appendage beneath the lower one, which latter character is best marked in the pelican. Their tongues are more or less rudimentary, and this is likewise true of their nostrils, which are absent in the

Gannets. Most of them lay but a single egg, while the Anhingas or Snake birds may lay as many as five, and they nest upon rocky ledges or isolated islets, in rude nests on the ground, or in low shrub-like trees or bushes.

In all instances the young are featherless when hatched, but soon clothed with soft, white down. With respect to their breeding habits, they are all gregarious, nesting in colonies, and, insofar as the Gannets are concerned, in enormous numbers—a fact that will be more fully touched upon further on in this article.



OLD GANNET AND YOUNG ON BASS ROCK

Note the snowy white plumage of the adult bird, and the beautiful soft white down on the young bird with its jet black bill. The baby Gannet emerges from its egg at the end of June usually blind and bald, with small feet, a large head and a mouth of dark, bluish-grey, but in twenty-four hours it has gained strength enough to stretch its wings. On the eighth day its eyes are open and by the ninth it can squall vigorously.

The Gannets are all arrayed in one family, the Suidae, and that this group contains but one genus, *Sula*, there being associated in it some six species of Gannets, though only one of these is called the Gannet (*Sula bassana*). All the rest are known as Boobies—as the Booby, the Blue-faced, the Blue-footed, the Red-footed,

and Brewster's Booby. All these have some of the habits of the species here described.

Gannets are strictly oceanic birds, and are only found inland when they have been driven by storms, or for some reason or other missed their accustomed migratory routes. It is a big bird, as big as a goose; and hence, among a good many other names applied to them throughout history, they have been called Solan Geese, or simply "Solans." They are wonderful on the wing, flying with great rapidity, and plunging down from the air in a most extraordinary manner to seize the fish upon which they prey.

One of the most remarkable facts with respect to these big sea birds is their extraordinary gregariousness. At the breeding season and at other times they congregate in thousands on rocky, isolated islets occurring in their area of distribution, and there they build their seaweed nests in great communities on the ledges, each female laying a single, rather large, chalky white egg, tinged with greenish-blue. On our side of the Atlantic Ocean, the Gannets breed in enormous numbers on Bird Rock and on Bonaventure Island in the Gulf of St. Lawrence, while they breed in similar situations on several of the islets off the British coasts. During the winter these birds are to be found as far south as the Gulf of Mexico, and northward to the coast of North Carolina; while on the other side of the Atlantic they occur in more or less numbers on the Canary Islands, at Madeira, and in the Mediterranean off the African coasts.

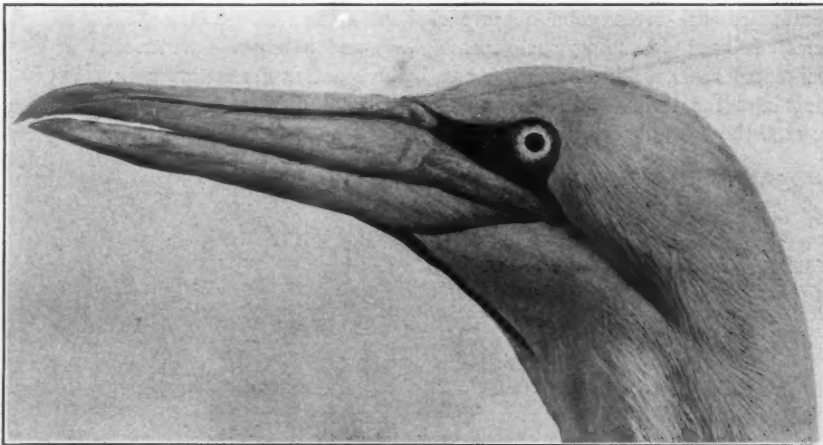
So strong is the gregarious instinct in these birds that they are rarely seen singly; and they are truly beautiful creatures upon the wing, or when swimming in numbers on the billows of the ocean. Indeed, the flight of the Gannet has been described and figured by scores of writers since the earliest times in history. For instance,

Doctor Lucas, a modern contributor, says this about it: "The height at which the Gannet flies above the water is proportionate to the depth at which the fish are swimming beneath, and Captain Collins tells me that when fish are swimming near the surface the Gannet flies very low and darts obliquely instead of vertically

upon its prey. Should any finny game be seen within range, down goes the Gannet headlong, the nearly closed wings being used to guide the living arrow in its downward flight. Just above the surface the wings are firmly closed, and a small splash or spray shows where the winged fisher cleaves the water to transfix its prey. Disappearing for a few seconds, the bird reappears,

rests for a moment on the water, long enough to swallow his catch, and then rises in pursuit of other game."

The islets where Gannets have bred throughout history are known as "gantries;" the birds are extremely tenacious of them, and breed not at all elsewhere. The islet Lundy, off the British coast, has been deserted; others are Wales; Grasholm, on the coast of Pembrokeshire; Ireland: the Bull Rock, the Skellings; Scotland: the Bass Rock, Ailsa Craig, St. Kilda Islands, Sulisgair (or North Barra), the stack of Stack and Skerry. Faero: Myggenaes. Iceland: Sulusker, Eldey, Grimsey. No Gan-



HEAD OF OLD MALE GANNET

Gannets possess wonderful power of vision, but on the other hand their sense of smell and hearing is notably poor. They have no nostrils and their ears are covered with dense feathers. The plumage of the adult bird is white, primaries and coverts black; the bill grayish, tinged with greenish or bluish lores, and the throat sac black. The feet are black with greenish or bluish scales. This bird was once a resident of the famous Bird Rock.



AN EGG OF THE GANNET (*Sula bassana*)

The gannet lays a single, white egg in a nest constructed of seaweed. This egg, when incubated, turns a mottled earth-brown. The white eggs are made so by an overlay of chalky matter, which may be scraped off. Because of their precarious nesting habits, the gannet eggs are quite often broken.

net settlements are now known to exist on the mainland of any country, anywhere. It is strange that in the places enumerated they breed by the thousands—in earlier years by the millions—and not anywhere else. Ages ago these gannetries were leased to corporations, which had the sole right to collect eggs and kill the birds for their patrons, as both were much in demand for the table. These rights were designated as "Inquisitions" or "Ex-tents," and some very ancient records of them are on file, especially in England. One of the oldest of these is that of Lundy Island, which is off the north coast of Devonshire, where in former years the gannets bred in enormous numbers.

Off the coast of Ireland both the "Bull" and the "Little Skellig" are occupied by many thousands of gannets, and their precipitous cliffs are simply packed with their nests in the breeding season. From one cause or another, the bird population of any gannetry may be reduced to a very scant number; then, favorable times coming, a recruiting takes place,

and the number of gannets again mount up into the thousands. At present there appear to be some 16,000 gannets on Skellig and only 500 on the Bull. Ailsa Craig, in the Firth of Clyde, Scotland, is, next to Bass Rock, the most accessible breeding place of these fowls.

The history of the gannets on Ailsa Craig is a long and very interesting one. In the old days, when the "fowl-

ers" used to gather up the gannets on the Craig, they killed them by a blow on the neck with a billhook or with a cudgel; some, perchance, were knocked into the sea and got away. A few of these have been found by naturalists; and Dr. R. O. Cunningham has evidently examined the healed or partially healed injuries of some of them, reporting the fact that gannets make most remarkable recoveries from such wounds, especially in the

matter of the reuniting of fractures of the bones.

Mr. Gurney has visited Ailsa Craig in person, and in his book he has given us the most wonderful account of it; he gives as a present estimate that the bird colony there averages a population of some 6,000 individuals. Another writer gives it 30,000; but we must believe that he is very wide of the mark.

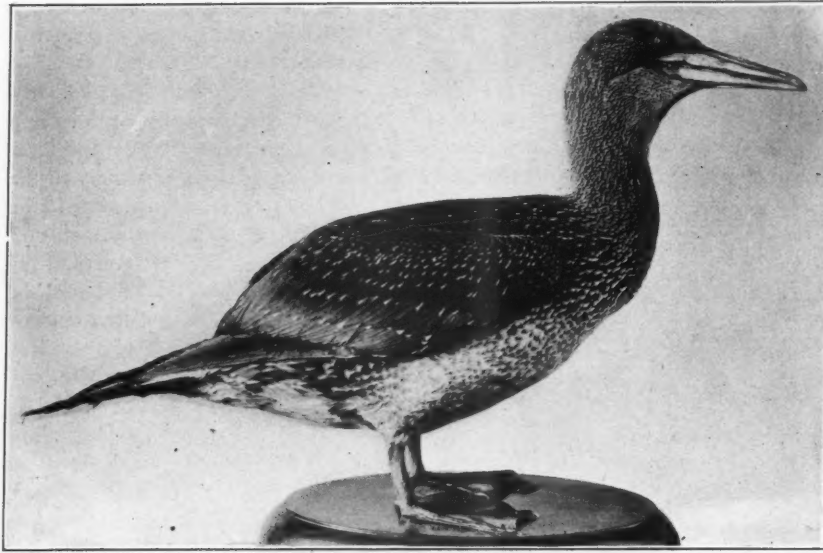
To pass on to our own side of the Atlantic, we have the gannet-rocks on the coast of Canada, which latter have been visited by a number of American ornithologists. Upon the whole our treatment of the gannets will be found

to be a sad story and an object lesson in the matter of conservation; for, as we have wasted thousands upon thousands of acres of the timber constituting our forests, so we have, at different times, wiped off the face of the earth millions upon millions of our birds—the most beautiful of all living forms inhabiting this planet. However, there is this wonderful difference—forests can be



THE GANNETRY OF AILSA CRAIG

Ailsa Craig is one of the great breeding places of the gannet; it is situated off the coast of Ayrshire, in the Firth of Clyde, Scotland. The view here is of the West Cliff. This famous rock is about nine miles off the coast, and rises 1,114 feet above the sea-level; it is composed of columnar syenite, like the columns of the celebrated Giant's Causeway, and it is atop of the broken-off columns that the gannets build their nests.



THE GANNET IN IMMATURE PLUMAGE

This young gannet has the livery of the species when it has attained the age of about five months. The plumage of the young bird is dark brown with a tinge of olive, spotted or streaked everywhere with white. On the head and neck the spots tend to form streaks. On the back and wing coverts they are triangular, usually one on the end of each feather. The primaries and tail are dusky. It requires three years for the bird to attain perfect plumage.

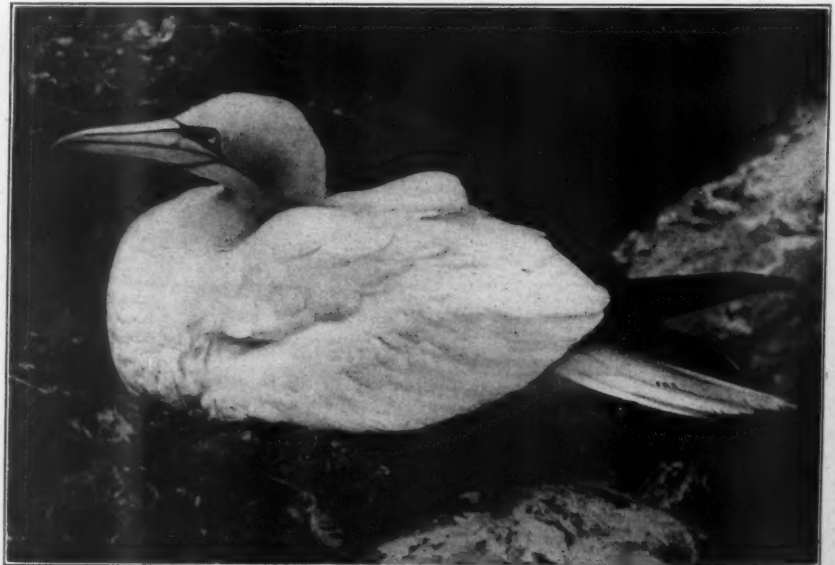
planted and restored, while no legislation known to man can ever restore any species of bird after it is once utterly exterminated. Our Wild Pigeon is gone—and gone forever, and other forms are rapidly following it. Ages ago, the Great Auk and the Gannets flourished in hundreds of thousands on the rocky islets and islands of the mouth of the St. Lawrence River on the eastern coasts of Canada, or on Gannet Island to the north of it. As is well known, the Great Auk was a big, heavy bird—flightless, but a good swimmer. Then, off those coasts came the fishermen with their boats, and it was soon found that these Great Auks made good fishing bait “off the Banks.” So they went ashore; and for this and other purposes, these fishermen slew the Auks by the thousands. Their last stand was on Funk Island, the largest of all the islands mentioned; and there, before the middle of the last century, the last of all the Great Auks in the world was exterminated.

Next, these fishermen and their descendants got after the gannets, which they likewise used for bait; probably they

used these also for food as they did their eggs. Gannets then bred in hundreds of thousands on five different islands and at one point on the coast, namely on Gannet Rocks. Besides the two mentioned above, these islands were Perroquet, Bonaventure, and Bird Rocks, and here, in due time, utter extermination seemed to be their fate, when fate determined otherwise and it was averted. Now they breed by the thousand on but two of these islands—Bird Rocks and the Island of Bonaventure, and, at this writing, gannets seem to be increasing in numbers every season, which is fortunate, as these breeding sites constitute one of the most picturesque features of those coasts; and as to the gannet exterminating the fishes in those waters—that is clear moonshine, belonging in the same class of myth as that of the cormorants

eating up all the fish in the sea off the coasts of southern Australia. The timely efforts of the distinguished explorer of the Commonwealth, Captain S. A. White, averted that disaster.

The first mention of these North American gannets was made by Jacques Cartier in 1534, who said, “we reached land on the seventh of July, landing at Bird



AN ADULT GANNET ON ITS NEST

This view was taken on Bass Rock, one of the wonderful “gannetries” of history; it is at the entrance to the Firth of Forth, Scotland, quite close to the shore on the southern side, and not so many miles from Edinburgh.

Island, which is fourteen leagues from the mainland; this abounds with birds, so much so that all the ships of France could load up with them without any apparent diminution. Here we secured two boat-loads full for food."

In June, 1833, Audubon saw these Rocks from the deck of the Ripley, and since his day they have been visited by a number of American naturalists and ornithologists, who have given us most interesting accounts with photographic and other illustrations of them.

So much, then, for the accounts of our explorers, none of whom found the gannets anything like as numerous at their various breeding sites, as in the days of Jacques Cartier and the early explorers.

The Gannet lays a single, white egg in a nest constructed of seaweed; this egg, when incubated, turns a mottled earth brown, and has been so figured by Mr. Gurney. The white eggs are made so by an overlay of chalky matter, which may be scraped off. They get very dirty before they are hatched, and not a few are broken in one way or another. At their precipitous, rocky places of breeding, every available ledgelet may have a nest upon it, the sight being, as a whole, one to be marveled at

as belonging in the list of the world's wonders. Nearly all large gregarious birds lay but a single egg to the clutch, and when we find two in the same nest, the second one was doubtless laid by another individual.

Gurney says: "Under normal conditions a nestling Gannet emerges from its egg at the end of June, blind and bald, with small feet, a large head, and a mouth of dark bluish-grey, and, in twenty-four hours it has gained strength enough to stretch its wings; on the eighth day its eyes are open, and by the ninth it can squall vigorously." The feeding of the nestlings by the old ones makes another very interesting chapter in their life histories.

Many facts in the lives of gannets, as well as in the lives of other large marine birds, are entirely unknown to the general public. When the time comes for the young birds to look out for themselves, some remarkable developments take place. "The flight, or rather descent

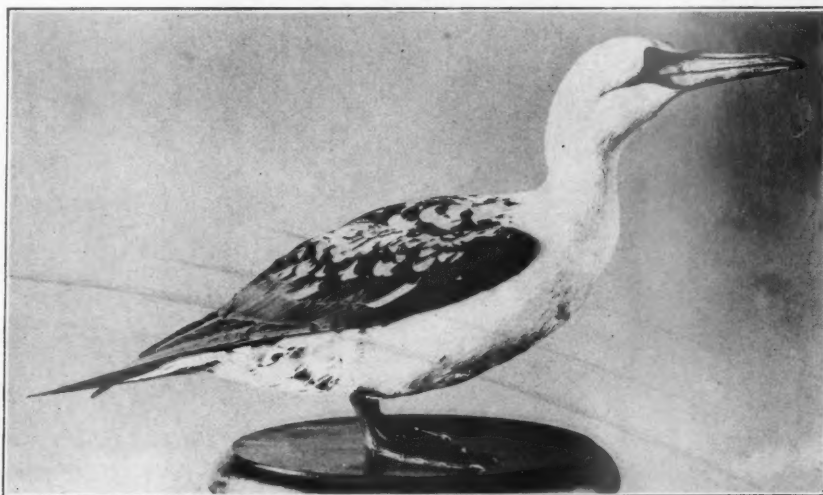
of the young Gannet from its natal ledge is a very unsteady performance," says Mr. Gurney; "yet on the whole it is well sustained, so that the bird has probably achieved a distance of half a mile before the final descending curve into the sea takes place, which ends with a mighty splash, caused by the impact with the water."

* * * When once launched, the young Gannet is comparatively safe, except that it is now in some measure at the mercy of the tide. In the sea it remains, drifting hither and thither for a space of two or three weeks. It is apparently unable to rise from the water, and all evidence points to its receiving no food whatever, except the sustenance contained in its own subcutaneous layer of grease, which is considerable, enough to impart nutriment to the rest of the body."

Calculations have been carefully made that go to show that when an egg of a gannet is hatched on the first of July, the young bird does not begin fishing until

the 25th of the following September. Young albatrosses are so laden with their own fat that one of them may go five months without taking any nourishment; this is likewise true of young penguins and of other sea fowl.

Adult gannets exhibit great affection for each other and for their



TWO YEAR OLD GANNET

At this age the plumage has nearly assumed the colors of the adult bird. These birds subsist upon quite a variety of marine fishes, ranging in length all the way from sardines to big herrings, which they capture by plunging for them from the air to the sea, where their victims are innocently swimming near the surface.

young. Jealousy is another of their traits, as is their short-lived combativeness, when their nests on the precipitous ledges crowd each other during the breeding season.

Gannets possess wonderful power of vision, but upon the other hand their sense of smell and hearing is notably poor; they have no nostrils, and their ears are covered with dense feathers.

These birds subsist upon quite a variety of marine fishes, ranging in length all the way from sardines to big herrings, which they capture by plunging for them from the air and scooping them up with their mandibles while swimming on the sea, where these fish occur in numbers near the surface.

In addition to their normal mortality, gannets are destroyed in many ways; but all that side of their history must be omitted here for lack of space, together with many other interesting facts regarding them.

STATE FORESTERS STUDY BLISTER RUST DAMAGE

CONTROL of the white pine blister rust was the principal subject considered at the annual meeting of the Association of State Foresters, held in New York State on September 20-22. Representatives of the Forestry Departments of sixteen states, the Province of Quebec and the United States Department of Agriculture were present. A trip of 80 miles through the splendid white pine forests of the eastern Adirondacks occupied the first two days. The third day was devoted to a study of top logging and other methods of fire protection in the Adirondack Preserve.

The members of the Association motored from Albany to Chestertown, New York, on the first day. A stop was made at the State Forest Nursery at Saratoga, which contains over 1400 seed beds and 18 million trees.

Observations were made of conditions on a large estate at Lake George, where, in 1917, blister rust was

found established on ten acres of white pine. Trees 50 feet in height are now dying as a result of blister rust infection that occurred prior to 1918. Numerous dead and dying pines of smaller size furnished convincing evidence of the destructive powers of current and gooseberry bushes when infected with

the rust. The wild and cultivated currants and gooseberries on and adjacent to the tract were uprooted in 1918; and as a result, the foresters were unable to find any recent blister rust infection on the pines except in one small area, where a few wild gooseberry bushes had been overlooked in 1918. Adjacent to these bushes the pines show numerous blister rust cankers of 1918 and 1919 origin. Cankers caused by infection in 1920 and 1921 are not yet visible, since it takes three years after infection for the blister rust swellings to develop on pine.

Several hours were spent at Horicon, New York, in observing the severity of damage in a typical old pasture lot growing up to white pine. Some of the trees are 30 feet high, but most of them are under 15 feet. Large,

wild gooseberry bushes are scattered among the pines. Infection first occurred about 1913, and now over 80 per cent of the pines are dead or dying from blister rust cankers on their stems.

Most of the trees large enough to produce seed have numerous cankers on branches and trunks, and are doomed to ultimate death. Small seedlings on this area are conspicuous by their absence, and those present are practically all diseased. One tree three inches high had two stem infections, and on a three-foot pine nearby 28 rust cankers were counted. A tree ten feet in height had 48 cankers of such recent origin (1918 and 1919), that the foliage was still entirely healthy in appearance. This tree was pointed out as an example of the deceptive nature of the rust. The pine tops remain green several years after their trunks are girdled. The real damage is done long before the tree finally succumbs.



FORESTERS IN ATTENDANCE

Some of the foresters at the recent meeting of the Association of State Foresters, photographed after the luncheon at the State Blister Rust Camp at North Hudson, New York.

Several years ago this stand could have been saved by uprooting the gooseberry bushes within 200 yards of the pines, at a cost of 75 cents to \$1.00 per acre for hired labor, or less if the owner had done the work in spare time. The foresters were shown an area near Horicon where the wild gooseberries and skunk currants were de-

stroyed in 1918. A check made in August, 1921, showed that there were 155 white pines under 20 feet high on a quarter-acre plot, of which 45 were infected with blister rust. The entire absence of cankers on the wood of 1918 and 1919 growth attests the effectiveness of the control work.

The second day the party traveled 50 miles through the heart of the white pine region of the State. Pines with blister rust "flags" (branches killed by the rust) were observed everywhere along the route. At one point a white pine plantation made in 1915 already had half of the trees infected, due to the presence of a few wild gooseberry bushes in and around it. At North Hudson wild gooseberries were observed to be numerous and

(Continued on page 794)

HONOR ROLL MASONS OF PENNSYLVANIA

Trees have been planted for the following and registered with the American Forestry Association, which desires to register each Memorial Tree planted in the United States. A certificate of registration will be sent to each person, corporation, club or community reporting the planting of a Memorial Tree to the Association.

Charles S. Miller (9), Daniel S. Keller (43), Lester L. Rohe (45), Emeal M. Semmelrock, Jr. (45), Emanuel R. Wilson (51), Charles S. Hinchman (52), Wilbur B. Small (59), Charles O. Rose (59), William G. Davies (61), Harry Lyons Greenwood (67), Ernest Z. Stead (67), Harry Timothy Mara (67), Howard A. DeLaney (70), Frank Raymond Bower (70), Ransom Bardwell Grumme (70), John K. Bender (72), William Ray Hartman (106), Walter E. Smith (114), Maurice Chasin (114), Joseph Lewis (115), S. Harold Boyd (135), Conrad Walter Ziegler (155), Leonard S. Persichetti (155), Joseph R. Milligan (158), Howard W. Kahler (163), Brewster Cameron Schoch (194), Samuel Musser Rine (194), John Z. Steese (197), Earl W. F. Childs (203), Charles E. Huzzard (211), Charles G. Murphy (211), William L. Shattuck (218), F. Ivan Knorr (218), Andrew E. Morrison (218), Benjamin Moore (223), John S. Winner (224), George Rupp Pretz (226), Herbert Moore Harbach (226), Stanley Kline Smith (227), William Schwind (230), Frank E. Seifert (230), Harry C. Hill (233), Benjamin F. Havard (233), Alfred Stevenson (236), Howard H. Raabe (238), Harold E. Warner (240), Perry Stevenson Gaston (243), Frederick David Clare (246), Grover Goodall (250), Charles H. Boisseau (252), Harry W. Miller (249), Chester A. Patterson (249), Hubbard H. Bahr (254), Arnold Huber (254), William G. Ruth (254), Harry L. Stevens (254), Wallace W. Fetzer (256), George O. Keiser (256), George E. Phillips (261), Lester W. Johnston (262), E. Clare Rebert (266), Frederic Charles Dose (268), Elmer Charles Miller (269), Edward Krauss (271), Robert John Patterson (272), Carl Anthony Fenner (273), Elliot C. Weller (273), Emlen F. Hawthorne (274), Thomas B. Anderson (275), Robert E. L. Barlett (277), William Freed Caldwell (278), Gilbert Doolittle (278), Raymond W. Bodder (283), Howard Lee Strohl (283), John Dorrington (287), William S. Kast (287), Clyde A. Trotter (287), Robert H. C. E. Black (289), William D. Geizer (289), Gilbert M. Newburger (289), Frank O. Amon (290), Theodore G. Scholler (292), Richard Burton, Jr. (292), William T. Shetzline (295), David G. Cooke (296), Thomas C. Allen (296), Roland H. Ritter (299), Clair Logan Hicks (300), Frederic Barradaile Prichett (303), Homer R. Austin (306), Oscar M. Hykes (315), W. Earle Champaign, Jr. (317), John S. Baldwin (322), John H. Ballamy (332), Thomas Jenkins, Jr. (337), John Franklin Downer (337), Archie L. Tanner (338), C. Justus Criswell (343), Walter Gustav Horak (345), Harold Haines Bair (348),

Homer William Robinson (348), Homer E. Dennis (350), Ernest Angell (351), William Pierson Derickson (352), Darius Brown Whitesell (354), Antes S. Lintner (355), Samuel S. Crouse (358), Raymond V. Martin (361), Franklin B. Trosh (363), Lester I. Kistler (363), Charles B. Case (365), Stanley J. Platt (372), Kenneth Brown Hay (379), John Garner Wilson (379), Michael Jaffe (383), Joseph F. Bellak (384), John B. R. Bennett (385), George C. Kameron (385), Elmer Z. Kinsey (385), Edwin S. Ledlie (385), Albert M. Muellerschoen (385), Merle C. Reed (391), Richard Karl Reznor (392), William A. McCollough (396), Torrence H. Deise (397), Ellis Lewis Griffith (400), Clyde F. Mowrer (401), Orville S. Kidwell (402), Thomas Reed Ferguson (417), Joseph G. Brickley (419), William A. Freihofer (419), John Binns (420), Alfred Y. Hendricks (420), Ralph Hubert Ficks (431), Frank Dolan (432), Charles Raymond Ewing (437), Lyman G. Saunders (445), John McC. Marshall (448), Charles N. Patterson (448), David J. Norris (449), John E. Lillich (451), Charles E. Kohr (451), George Howard Ott (453), Clarence

Huth (508), William Crawford Cole (508), Marshall Hughes, Jr. (511), Frederick H. Keithan (511), Samuel M. Shelly (512), Clyde E. Lutes (513), Ralph G. White (515), LeRoy Barber Boyd (517), Francis M. Miller (520), Walter Watson Craig (522), James McKenzie Henderson (522), Charles R. MacLeod (522), Thomas W. Astbury, Jr. (528), Lindsey Cochran Whiteside (529), Joseph Lewis Lang (530), David M. E. Griffith (541), Charles L. Clark (543), Joseph T. MacClurg (543), Clarence C. Kahle (546), Alfred T. Morrison (547), John T. Reed (548), James O. Newpher, (551), Howard Dimon Mastin (556), Gus Evans Warden (557), Willis B. Dunkle (557), Charles E. Egge (561), Howard C. Braddock (562), Clarence M. Mack (568), Jesse Gilbert Knecht (570), Paul J. Simison (575), Edmund W. Lynch (578), James W. McMeekin (578), Theodore G. Robinson (578), Wallace Craig Dickson (581), Norman Beadle Hallman (581), David Burton Foster (583), Harris D. Buckwalter (585), Joseph H. Stoner (588), Charles M. Rawlings (588), Daniel Burley (589), Jacob Edwin Deal (590), John M. Clarke (590),

Walter M. Godshall (596), Earl S. Crouthamel (596), David Clair Vosler (599), Harold Baker Merz (600), S. James Keister (601), Joseph S. Edwards (606), George B. Kolp (606), Harry J. Newkumet (606), Harvey W. Leidy (609), William L. Boshyshell (610), Harry B. Rodas (610), Corwin B. Taylor (610), William F. Guilfoyle (610), William Cecil Short (610), Charles V. Lemons, Jr. (618), Robert C. Waldo (618), Wayne R. Horton (618), Henry C. Welker (620), Charles D. Linderman (620), Norman C. Sherer (621), William F. Butler (626), Russell Cisney Parson (630), Mark H. Hasana (634), Elmer C. La Buhn (634), Howard A. Buent (635),



"MEMORIAL GROVE"

Showing the memorial trees planted on the Masonic Home's property of the Grand Lodge of Pennsylvania at Elizabethtown, which have been registered with the Association by the Hon. George B. Orady, of Philadelphia. There are 264 trees and in the list the Honor Roll gives the lodge number after each name. There were 11,323 Masons in the service of their country in the World War. A memorial volume has been issued with a foreword signed by John S. Snell, Grand Master, and John A. Perry, Grand Secretary.

Robert E. L. Barlett (277), William Freed Caldwell (278), Gilbert Doolittle (278), Raymond W. Bodder (283), Howard Lee Strohl (283), John Dorrington (287), William S. Kast (287), Clyde A. Trotter (287), Robert H. C. E. Black (289), William D. Geizer (289), Gilbert M. Newburger (289), Frank O. Amon (290), Theodore G. Scholler (292), Richard Burton, Jr. (292), William T. Shetzline (295), David G. Cooke (296), Thomas C. Allen (296), Roland H. Ritter (299), Clair Logan Hicks (300), Frederic Barradaile Prichett (303), Homer R. Austin (306), Oscar M. Hykes (315), W. Earle Champaign, Jr. (317), John S. Baldwin (322), John H. Ballamy (332), Thomas Jenkins, Jr. (337), John Franklin Downer (337), Archie L. Tanner (338), C. Justus Criswell (343), Walter Gustav Horak (345), Harold Haines Bair (348),

A. Goehmann (455), John Reeves Graham (457), Rupert C. Spencer (462), Benjamin F. Ludwig (462), Robert A. Boll (464), Francis E. Zeigler (464), George E. Snyder (465), William B. Hake (465), William E. Patten (466), John Flock Hauser (467), Austin W. Frankenfield (469), Ira M. Weikel (475), Clinton H. Garrett (475), Norman T. Scarlett (475), Gerald G. Griffin (477), William Manlove Hickman (481), Lester B. Rothschild (482), Thomas Brainerd Coburn (484), Elbert Shultis (484), William L. Sanderson (490), Charles G. Baird (491), Raymond J. Cubler (493), Horace F. Critchley (495), Albert J. West (499), Howell W. Williams (499), Samuel S. Wheaton (500), George W. H. Conrad (500), Thomas B. Patton (500), Charles C. Anderson (506), George H. Bauer (506), George R. Schumacher (506), Albert A.

mer C. La Buhn (634), Howard A. Buent (635), Robert F. Downie (635), Ross George Kiechel (637), Owen Frederick Jones (640), William H. Keenan (642), C. Bruce Brenizer (646), Paul S. McSparran (646), Albert H. Gaumer (646), Dunning Hart Ross (647), Charles W. Crede (647), Orville Ross Thompson (650), Walter C. Graham (650), Eugene F. Baldwin (653), Frank R. Kirk (653), Thomas G. Thompson (657), Zo David Stauffer (662), Gustaf Lewis Norstedt (670), Thornton O. Williams (672), M. Wilson Keith (674), Crandville Le Moyne Sargeant (674), William Thomas Davis (677), Earle R. Marvin (679), George Edward Daugherty (683), Ellsworth K. Davies (688).

THE STATE'S RESPONSIBILITY IN A FOREST PROGRAM

BY J. W. TOUMEY

DEAN, SCHOOL OF FORESTRY, YALE UNIVERSITY

IT IS now nearly two years since Mr. Graves, then at the head of the U. S. Forest Service, in a series of addresses throughout the country, initiated the discussion on forest policy which has since been almost constantly before the public. This discussion on natural and state forest policy and the wide spread publicity which followed have been of far-reaching importance to American forestry. Not only foresters but the timber consuming public appreciate more fully than heretofore that the present situation presents a most discouraging outlook for future timber supplies and for permanency in land utilization without a radical change in our forest policy. We are beginning to realize that provision for a continuous and sufficient supply of timber, carrying with it the bringing of permanent populations on nearly a third of our land area is a great, far-reaching social and economic problem which must be worked out by the present generation. This realization emphasized by the discussion and publicity of the past two years has caused two bills to be introduced in Congress, namely the Snell Bill and the Capper Bill. Both of these bills have the same object in view. The purpose of each is to provide adequate machinery to insure a continuous and sufficient future supply of timber for the needs of the nation. Each proposes, but by different methods, the management of private as well as public forests so as to secure the renewal of the forest crop. Both bills recognize that our future timber supply is threatened and that present wasteful methods of logging and neglect of cut over forest land must cease.

I take it, that the underlying reasoning back of the origin of both bills rests essentially in our land problem; in the appreciation that a sane and healthy national life rests more largely in the full and best utilization of the land than in all else combined; in the appreciation that the greatest gift that present society can bestow upon future generations is a land policy established in law that insures a permanent supply of raw materials that grow out of the soil.

The depletion of our forest resources has come through our failure, while using the reserves in our virgin forests, in not producing more timber through growth on areas that have been cut over in the past and on areas where the old growth has been destroyed by fire. The checking of this depletion and the building up of an adequate forest capital for our future needs rests in stopping devastation in future lumbering operations that regrowth may be rapidly attained and in the reforestation of present denuded and partially stocked areas.

To what extent will one or the other of the two bills now before Congress, if enacted into law, promote regrowth and reforestation?

The Capper Bill by giving direct power to the Secretary of Agriculture to control the methods of lumbering throughout the country, irrespective of state authority,

would if adequately executed, stop forest devastation as we now know it and promote regrowth following lumbering operation. This bill, however, would be almost negligible in promoting reforestation or the bringing of lumber crops again on the vast areas now denuded or only partially stocked with mostly inferior species but which, in the future, must again produce a considerable part of our timber requirements.

In my judgment the bill is inadequate, in that it provides for regrowth *only after future timbering*. The public and the states are generally opposed to national regulatory laws governing private forests so long as there is reasonable hope that effective results can be attained through state action. Unless, however, the states awaken to their great responsibility in checking destructive lumbering within their own borders and in the reforestation of the vast areas rendered idle and waste by past practices, the nation will be forced into legislation even more sweeping than that embodied in the present Capper bill.

What we do with the remnant of existing stands, how conservatively we log them, how successful we are in attaining regrowth after fellings will not give us for all time an annual output of wood as great as our present consumption. The great importance of our 137 million acres of virgin growth that remain uncut and on which three-fourths of our commercial timber now stands is to tide the nation over the next thirty to fifty years while we are organizing, stocking and developing those vaster areas that destructive lumbering and uncontrolled fires have so injured and destroyed that they are now producing in annual growth but a mere fraction of their possible yield and that mostly of very inferior kinds and quality.

Although there is no inherent reason why we cannot produce through growth as much wood annually as we now consume, is can not be done without a far-reaching, constructive forest program liberally supported by the public.

No nation has yet accomplished the task that we face through private initiative and enterprise. No country has been able to place forestry on a sound basis without laws which regulate operations on private forests except in those cases where there is a large public ownership of forest property. With four fifths of American forests privately owned some form of public control of operations on private forests appears essential.

Forest crops are long time, low interest bearing investments. They do not appeal to the private land owner. We cannot expect that the reforestation and protection of all classes of forest property now privately owned will or can be assumed by the owners. Yet, if we carry through a policy of reforestation and protection at all

adequate to meet our needs, somehow and in some way, they must be forthcoming.

It is my judgment that the only course that will make for regrowth on an adequate scale is an appreciation on the part of the public that sustained yield even in privately owned forests is its concern and not wholly that of the private owner, and a willingness on its part to work out and put into operation a workable plan of cooperation under which reforestation and protection on privately owned forest land is a burden to be assumed by both the public and the private owner but with the public exacting the requirements essential to attain the object in view.

If the public is to secure the benefits flowing from the wise use of privately owned forest lands it must offer its cooperation and assistance to the extent of making it economically practical to the private owner.

As the growing of lumber cannot be left to private initiative, authority imposed on the private owner of forest property in order to attain the regrowth essential for the perpetuation of our forest industries must come through the nation or state. Mandatory laws, however, imposed by either the nation or state, which place financial burdens on the private owners of forest property would be ineffectual in my judgment in attaining the object desired. Our economic structure is built on the inviolability of private property and just compensation when such property is restricted in its use in order that the public may benefit. *If mandatory regulations are imposed on privately owned forests in order that the public may benefit and at a financial loss to the owner, it is reasonable to ask the public to pay for the benefit received to the extent of this financial loss.*

Although I see the danger in mandatory laws regulating the management of privately owned forests if unwisely applied, I see nothing but great good in such laws if wisely applied. Mandatory regulation is essential in any adequate forest program but such regulation must rest on public assistance and cooperation.

Generous public aid must be available to the private owner in controlling the fire hazard attendant in growing an inflammable crop which takes a generation or longer to mature. Public aid must be available in the adjustment of taxation in harmony with the nature of forest crops. Public aid must be available in attaining regrowth by modern silvicultural methods. *In short, the public must make it economically practical for the private owner to grow fully stocked stands of timber and not attempt to coerce him in growing them at a financial loss.*

The Snell bill emphasizes the cooperative principle and the need for public assistance in establishing forestry on privately owned timberlands. This bill as it is now drawn does not recognize the mandatory principle as applicable to privately owned timberland. It recognizes, however, that the nation, the state and lesser governmental units must work together in attaining regrowth. It is a good bill in many respects but in my judgment has one serious defect. *It does not recognize the fundamental necessity for public regulation of operations on privately owned forest property.* In providing for cooperation and general financial assistance to private forest owners through the several states it does not provide that *the states before benefiting by its provisions shall first pass regulatory state laws covering the important forest districts within the state.*

In my judgment it is the function of the state to determine the essential requirements for regrowth; to work out the cooperation plan with the national government and determine just compensation to private owners by the public in the form of tax adjustment, fire prevention and control, planting stock at cost and other assistance in state-wide reforestation and improvement of cut-over lands. When the public is willing to do its part, state mandatory laws essential for regrowth adequate for our future needs, will meet little opposition and on the whole they will be effectively carried out.

A PICTURE "PAINTED" WITH WOOD

BY HARRIS SAMONISKY

JOHN T. PERKINS, of Wilmington, Delaware, has completed one of the most unique pictures in the United States, in which he used 37 varieties of wood, collected over a period of nearly forty years, with not a single drop of paint used in the entire "photograph." The wonderful work of art is 22 inches by 24 inches and required about six months of steady work for its completion.

The picture, called, "Pals," represents a scene of boyhood days, with the many kinds of wood inlaid to represent the scene. All coloring and variations of effect are produced by the natural color of the various woods. The picture consists of wood entirely, with a coat of shellac over the surface. The principal figures in the picture are the "Pals," a barefoot boy with worm can and fishing pole and his dog looking up with an expression of inquiry.

The boy is about to cross a brook, while behind is a landscape with roads and trees, sky and clouds.

The idea came to the unusual artist, a skilled woodworker, while he was on a trip to Washington last year, when he saw a wonderful work of sculpture. He thought then that if a sculptor could accomplish such results with stone, he should do as well with wood. Upon his return he started to work on his picture with different bits of vari-colored wood he had been collecting since 1882. The work is now on exhibition at the home of the artist.

While no photograph can do full justice to the picture, owing to the many hues of wood contained and the various shadings, the representation given here will convey some general idea of the work. The thirty-seven different kinds of wood used are: African mahogany, amaranth,

amboyna, American poplar, American white-oak, balsam, bird's-eye maple, black ebony, black walnut, boxwood, cherry, Circassian walnut, curly birch, East Indian mahogany, English oak, freak ebony, French beryl, Georgia pine knots, Georgia heart pine, hazel, Honduras maple, Hungarian beryl, laurel from Lookout Mountain, Tennessee, palmetto of Venezuela, petrified hickory, red gum, rosewood, San Domingo mahogany, satinwood, tulip, vermilion of Asia, white holly, wild coffee of Isle of Jamaica, white mahogany, Zanzibar blue, thorn and Bahama mahogany.

A minute inspection of the picture shows many interesting details. All the lines, shadows, shadings, and coloring of every kind, is secured by carefully selected wood. Taking the figure of the boy first,—the hat is formed of satinwood, hazel and white holly; the hair of African mahogany; eyes, white holly, French beryl and black ebony; eyelids, eyebrows and shade lines, hazel; nostrils and

interior of ears, red gum; lips, tulip; teeth, white holly; line forming chin, rosewood; face, white holly; jumper or shirt, Hungarian beryl and ash; buttons, end-grain of boxwood; tear on right shoulder, ebony; interior of arm-hole, sleeve bottom, dark beryl; undershirt sleeve at right wrist, white holly; hand and worm can, white holly; shading of worm can, dark birch; overalls, curly birch; suspenders, mahogany; buttons, black ebony; patch, maple, beryl, white holly, vermilion; parting lines to form two legs, ebony; feet and toes, white holly and ebony; fishing rod, thorn with light tulip in end; fishing line, Honduras maple; fishing float, light tulip and Honduras; fishing hook, cut in with ebony dust; fishing stick in float, rosewood.

In the dog, the nose and all shading, including mouth are of ebony; eye of boxwood and balsam; body, legs and tail, beryl, Circassian, ebony. The path or footing for boy and dog is natural freak ebony; stump at dog's



THE WOODEN PAINTING

Wood in natural colors was the only paint used by the artist in making this picture—and it took thirty-seven varieties.

left hind foot, Circassian, pine knot; stumps at bottom, amaranth, ebony, Georgia knots; title plate, "Pals," petrified hickory, ebony, thorn; to left of stumps, amboyna; bird, Zanzibar blue, thorn, ebony, red gum, tulip; flower bud, palmetto, and grain; leaves, wild coffee, laurel, thorn, satin and balsam. The bottom and sides of the boat are of tulip; ribs, thorn; seat, rosewood; gunwale, white holly, ebony and thorn; thwart, Bahama mahogany and rosewood; oars, red gum.

The cat-tails are of amaranth and poplar; bird's-eye maple at each side of boy, also Hungarian. Directly above boat are rocks in the water, shadowed from timber above. The lower right-hand corner is of English oak, then above, twin stumps of Circassian and pine knots; vine of bird's-eye, pine heart and light tulip; purple boulder is amaranth, a very hard wood; above that is Circassian,

amboyna and a very handsome specimen of the lights of the Asiatic vermilion.

The boulder behind the dog is Circassian, lined with rosewood. The stump is of the same family, with main body of the mahogany of East Indies. The tree beyond is of curly birch; leaves, of vermilion and Hungarian ash family; road is rosewood below, curly birch above; house, white holly, rosewood; chimney, vermilion; water beyond, of hazel family.

In addition to the work done on the picture, the artist has completed a large amount of hand-made furniture of carefully selected woods. His home is a veritable treasure trove of unique articles ranging from inlaid record cases to carved chairs. His hobbies are music and art. In early life he did much work with the artist's brush, which accounts for the wonderful harmony of colors in the "wooden painting," as he calls his work of art.

A TYPICAL STAND OF WHITE PINE IN NEW ENGLAND

NOTE the dense stand of young growth seeded from the older trees in the rear. White pine is one of the most valuable timber trees, and is adapted to a wide range of soils. It is usually found on sandy or light soils, but will thrive on any land that is well drained. White pine plantings are a safe investment if currant and gooseberry bushes are first destroyed within 200 to 300 yards. The cost of protection from the blister rust may be reduced by selecting planting sites as far

and labor of planting, was \$35. The timber today is worth on the stump something over \$1,500."

"The farmer had this strip of practically worthless side-hill, and with some spare time on hand dug up 1,400 seedling pines growing in a thicket and set them out. About 20 years later the farmer died and among his assets was this small tract of young pine for which, much to her surprise, the widow was offered \$300. The second owner retained it for about 15 years and then,



WHAT WAS FORMERLY WORTHLESS SIDE HILL—PLANTED TO WHITE PINE AND TRANSFORMED INTO A BEAUTIFUL STRIP OF VALUABLE TIMBER

removed from cultivated currants and gooseberries as possible, and where the wild bushes are naturally few or absent. The following example of profit in growing white pine is given in Farmers' Bulletin 1117 of the United States Department of Agriculture: "An abandoned, side-hill pasture of about three acres in New Hampshire was planted to white pine 44 years ago. It now contains about 90,000 board feet of lumber. The total outlay at the time, counting the value of the land

wishing some money, sold it. Soon afterwards it came into the hands of the present owners, a lumber company, for something over \$1,000.

"Assuming a land value of \$5 per acre, and a charge for taxes and oversight for the period averaging \$2 per acre per year, the operation has yielded a return of 5 per cent on the total investment in land, labor, and annual outlay, and in addition a neat sum equivalent to a yearly net profit from the start of over \$5 per acre."

FOREST WASTE IS AN INDICTMENT-

CONTINUED DEMANDS for action on a national forest policy are found in the editorial comment of the newspapers of the country, all of which are rendering fine co-operation in the campaign of the *American Forestry Association*. Some of this comment follows:

Birmingham Age Herald: The *American Forestry Magazine*, which is making a great fight for the preservation of America's timber resources, publishes an article showing by a series of striking comparisons the appalling waste that goes on every day in this country. The protection and conservation of the forests cannot be too strongly urged on state and national legislatures. Few people realize what it means to the future of this country, timber being one of the most indispensable products nature gives to mankind.

Rochester Democrat-Chronicle: Doing is what counts. The only way we can ever get the forestry situation in the United States back where it belongs is to get busy and do the things needful. There was a conference of the Society for the Protection of New Hampshire Forests. President Charles Lathrop Pack, of the *American Forestry Association*, wrote the governors of northeastern states. In the course of his letter, Mr. Pack stated some facts that are more eloquent than rounded periods of argument. Connecticut spends \$3,000,000 a year on freight on forest products she should be producing almost at her factory gates. There are 81,000,000 acres of idle land in the East and Middle West that ought to be growing trees. Three-fifths of our original timber is gone, and half of that which is left is west of the Rocky mountains. What this means in freight rates is not difficult of comprehension.

This is just an item or two from the bill of indictment of the American public as a result of its criminal waste of natural resources with no provisions for repairing the waste. The whole bill constitutes one of the most humiliating arraignments ever made of a nation.

The facts have been presented. The timber is disappearing. The cost is mounting. It is already almost prohibitive. And nothing adequate is done. Will we con-

tinue the policy of "letting George do it" until too late?

Pulp and Paper Magazine: A clarion call for action on the forestry question has been issued by the *American Forestry Association*. It urges upon publishers the necessity for taking immediate steps for the replenishing of forest crops to furnish future pulp material.

Springfield (Mass.) Republican: The *American Forestry Association* urges that

than 40 years, or, putting the facts more hopefully, a crop of good pulpwood may be grown within 40 or 50 years, and that an area as large as Ohio should be planted to spruce to provide a perpetual supply of material for making the newsprint paper demanded in America. One-tenth of the lands from which forests have been cut and which now are, mainly, valueless areas of growing underbrush and dangerous areas of combustible timber tops, would grow the spruce. No pulp, no printing. Printing is a necessity. Posterity might do

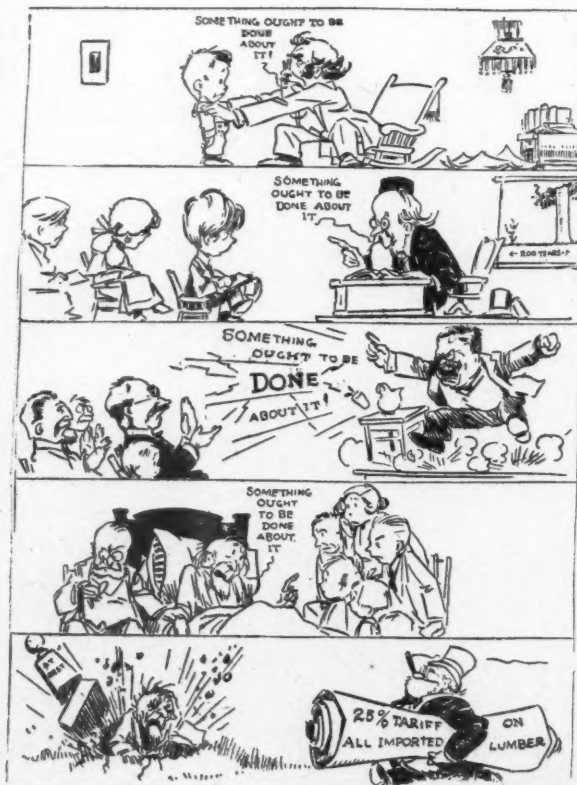
without the problem novel, but civilized man cannot do without news. Forty or 50 years would

be a long time for an individual to sit down and wait for a crop to mature, but no individual would be kept waiting for the spruce crop. It would be grown while we should continue exhausting the exhaustible supply. Wood pulp is only one of sundry products of forests without which the world cannot do, in so far as the world is at present informed. To depend upon the genius of man to discover some sort of substitute for wood pulp, another substitute for another forest product, is somewhat like seeking a substitute for onions instead of growing onions, despite the fact that a crop of onions may be grown within a few weeks. Until it is found that we do not need forests we shall need forests. Until some way is found to do it more quickly the best plan of producing a supply of wood pulp is to grow it by processes known and practical.

Providence Journal: According to the *American Forestry Association*, "there are 81,000,000 acres of idle land in this country that should be put to work growing trees at once." Manifestly the slogan ought to be "Plant a tree," or perhaps as the available idle land amounts to nearly one acre per capita it might be "Plant an acre." Anyway, it seems that the pressing need of the day is for backyard foresters quite as much as for backyard farmers.

Athens (Ga.) Banner: There is no more important matter before the American people so far as material progress is con-

A LIFETIME OF PROGRESS IN FOREST PRESERVATION



J. N. Darling, in the Washington Herald.

"there are 81,000,000 acres of idle land in this country that should be put to work growing trees at once." Unfortunately planting trees for posterity doesn't have anything like the same appeal as incurring bonded indebtedness for posterity to pay.

Louisville Courier-Journal: The *American Forestry Association* finds that a crop of good pulpwood cannot be grown in less

SAYS ROCHESTER DEMOCRAT-CHRONICLE

cerned than that of preserving the forests of this country and the reforestation of the country as well. *The American Forestry Association* is doing a great work in this respect. Every citizen should do his part to help these agencies forward the work of forest preservation and reforestation. Organizations cannot do this work alone nor can the federal government do it by itself. The need of assistance from the individual citizens and all kinds of citizen organizations and from the several states as well is apparent.

Milwaukee Journal: In considering a national forest policy we must consider a disease. That disease is forest devastation, the *American Forestry Association* points out. Its effect is a slow sapping of national strength—through the steady exhaustion of the national timber supply.

The effect will become fatal when, through the shortage and high cost of timber, the United States is reduced to the level of western Europe, when wood is priced as an imported luxury, when not only manufactures and trade are handicapped by lack of it but the comfort of our own people and the efficiency of our agriculture are straitened by its scarcity.

It is unthinkable that the United States will accept the necessity of curtailing largely, sooner or later, its use of timber. Abundance of wood for home and farm use, for varied manufactures and for export trade has been a primary factor in our commercial supremacy, so important right now, and it is a factor which we are not going to surrender.

The problem must not be met by using less and less wood, down to the level of civilized existence, as France has been compelled to meet it. It must be met not by decreased use, but by increased production, the association well argues. It must be met in the American spirit of development of enterprise, of an organized and far-sighted handling of our resources that will supply the future requirements of a continued liberal use of timber in national development and industries.

Hudson (N. Y.) Republican: Do you

know that the annual consumption of newspaper would make a two-foot strip of newspaper reaching forty million miles or half way to the sun? The war left us in a state of mind whereby no set of figures could stump us or give us pause until this statement from the *American Forestry Association* about the forest situation came along and we must admit that it takes "some trees" to keep industry going in this country. The time has come when we must grow timber.

Oil City Blizzard: The *American Forestry Association's* call on the business men of the country to wake up and join in de-

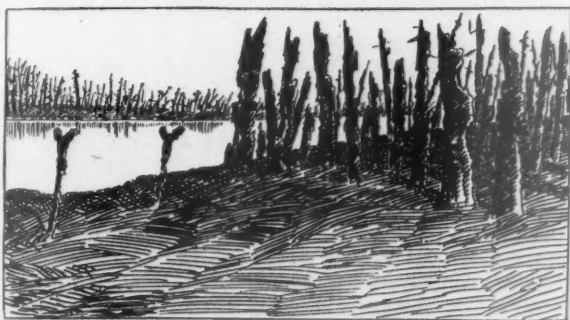
by complete destruction. We haven't taken any care of the forests, haven't even thought about reforestation, yet this means millions of dollars to the South every year.

Paxton (Ill.) Register: Few of us care much about the other fellow's business, but it so happens this phase of the forest products situation is of a piece with a problem that touches our whole economic life, for without forest products, business cannot go on. We cite our end of it to show the tremendous consumption of trees going on every day, to say nothing of loss by fires that sweep the forest areas. The *American Forestry Association* is campaigning for forest policy legislation. Every publisher in the country should be behind this campaign.

THIS IS ABOUT THE TIME OF THE YEAR WHEN—



—Some idiot at large in the woods starts a forest fire



—which destroys vast areas of beautiful timber.

—McCutcheon, in *The Chicago Tribune*.

manding that Uncle Sam take a hitch in his belt with a national forest policy should be answered by every business organization that faces mounting costs of everything. That would make it unanimous.

Thomasville (Ga.) Enterprise: We glory in the wonder of the pine woods, but we are not ashamed of the reckless abandon with which they are converted into money

Balaton (Minn.) Tribune: Why cannot the towns in all states take up such work and have a municipal woodlot or a community forest? There is plenty of idle land that will grow trees. Forest products are the backbone of all industry, as the *American Forestry Association* points out.

Hunter (N. Y.) Review: The thing needed is a national forest policy as being put forward by the American Newspaper Publisher's Association, the *American Forestry Association*, and the Association of Wood Using Industries.

Billings (Mont.) Gazette: In other words, says *The Permanent Builder*, which bases its statement on figures from the *American Forestry Association*, nearly one-fifth of all the manufacturing establishments throughout the country use timber in one form or other. Need of a national forest policy, for which the *American Forestry Association* is directing the campaign, is shown by the manufacturing

establishments which pay out annually in the aggregate \$14,250,000,000 for raw materials, and the part of the wood-using industries in that huge expenditure amounts to more than \$1,000,000,000, or 7 per cent. Indeed, trees seem to be closely related to the payroll and to national prosperity.

Waco (Texas) Times: The total number of forest fires exceed 30,000 a year.

From this it may be discerned that an average fire would not need be very extensive for the total loss to reach a staggering figure.

Charleston (S. C.) American:—There is no doubt much truth in the statement by Charles Lathrop Pack, president of the *American Forestry Association*, that in reforestation the south has great opportunity for wealth and for national service. As Mr. Pack pointed out, reforestation is badly needed in many sections of the south. The expert said the reclamation the south needs is of two classes—lands reclaimed for cultivation and those for forests. The forestry conference is important to all the people of the south, and it is to be hoped that plans will be made which will assure improvement in the present conditions and at the same time increase the wealth of the entire country. The matter of the preservation and reclamation of our forests is one of the most important problems of the country and yet comparatively few people realize it.

Atlanta Journal:—Atlanta is happy and honored to have as guests those particularly useful friends of conservation who are co-operating as the Southern Forestry Congress. Their cause is of national import and of utmost economic and human significance. Scarcely a region of the common country but suffers either the consequence or threat of the waste and destruc-

tion with which American forests have been treated.

Grand Rapids Herald:—Michigan is particularly interested in the bill introduced in the United States Senate by Senator McCormick, of Illinois, providing for co-operative effort on the part of the states and the federal government in the preservation of present forests and in reforesting. Few states of the Union are as vitally interested in reforestation as Michigan. That is true, because Michigan, originally a great timber state, has now millions of acres of unproductive land, much of which could wisely be given over to reforestation. Congress will be fully justified in taking the steps Senator McCormick proposes, the National Forestry Program Committee, the United States Forest Service and the *American Forestry Association* already having stamped the bill as progressive legislation.

Buffalo Courier:—A crop shortage is serious, but concern should probably be greater for the loss of forests. They cannot be replaced except by long years, at least a generation for even the faster growing of trees of lumber value. In Europe conservation of forests has been greatly advanced compared to what we have done in the United States.

Watertown (N. Y.) Times:—Some person with a penchant for statistics, has fig-

ured out that the annual consumption of newsprint in the United States would make a two-foot strip, reaching forty million miles or half way to the sun. Figured down more closely, he says that something like 5,000 full grown trees go into the waste basket of the country every day. This represents newspapers that have been read and thrown away. These figures come from the *American Forestry Association*, and are believed to be correct. The *American Forestry Association* is endeavoring to impress on the people of the country the economic value of trees. It wants better fire protection methods in the timber lands. We have come to realize the fact that we must grow trees. We have also come to realize the fact that we must use more discretion in cutting them.

Asheville Citizen:—Recent sessions of the *Southern Forestry Congress* in Atlanta appear to be bringing forth fruit in forestry legislation in Georgia. After years of declaration that something ought to be done, the people have decided to do something. The determination to conserve comes, it is true, too late to save to the people millions of dollars in timber, in erosion by flood and in the injurious effects of treeless wastes on climatic conditions. But the investment in a common-sense system of forestry is nevertheless a sound one; it is more than that, since it is the only way to prevent absolute destruction of forest resources.

REORGANIZATION OF COLORADO STATE FORESTRY ASSOCIATION

Reorganization of the Colorado State Forestry Association was effected in Denver during the evening of October 27, 1921, following a banquet attended by about twenty. Lou D. Sweet, prominent agriculturist and a leader in many public movements, was elected President, A. T. Steinel, the very live editor of "Western Farm Life," was chosen Secretary-Treasurer. A board of nine members was also elected, including two of the old board, Dr. John Grass and Frank C. Goudy, the heads of the two forestry schools in the State, Prof. Gordon Parker and Prof. W. J. Morrill, a representative from the State University, Dr. R. C. Lewis, Mr. H. M. Wheeler from the U. S. Forest Service, Mrs. Mary Louise Stickley representing the Federated Womens Clubs, Benjamin Griffith formerly Attorney General, and C. L. Hover, a leader in many agricultural organizations.

Prof. W. J. Morrill presided and spoke of the history of the organization. He said that at the time of the admission of Colorado as a state into the Union, a prominent civil engineer residing in the state, Frederick J. Ebert, trained as a professional forester in Germany, called attention to the necessity of forestry. He advocated that the United States turn over to the state its public forest lands in order

that the state might organize forest protection and forest utilization, and if unwilling to deed the forests to the state, that the United States be urged to save the forests for the future residents. But nothing was done. The forests were being destroyed by reckless exploitation and especially by uncontrolled conflagration during the first twenty years of statehood. Finally Col. Edgar T. Ensign of Colorado Springs instituted a series of public appeals through the press, culminating in a call for a meeting in Denver on November 19 and 20, 1884, at which time the Colorado State Forestry Association was organized with Col. Ensign as President.

It will be noted that the Association is among the oldest of the Forestry Associations of the United States, the first being formed in 1876 in St. Paul, Minnesota, and our American Forestry Association was organized in 1882 in Cincinnati as the American Forestry Congress. Public sentiment was guided by the Colorado Association asking that adequate measures be adopted to prevent the destruction of Colorado forests. Finally, in cooperation with forestry movements originating in other sections of the nation, national sentiment, some persistent forestry advocates, and an approving President, caused the inauguration of

the forest reserve policy, after necessary congressional action, intentional or unintentional, in 1891.

During the years of the fight against the Forest Service in the West, from 1906 to 1912, the Colorado State Forestry Association valiantly and effectively lent its assistance to the cause of forestry. During this critical period Mr. W. G. M. Stone, a retired business man and formerly a clergyman, was the President of the Association. His whole heart and his whole time was devoted to the forestry cause and all without remuneration. After the campaign against National Forests had died down, Mr. Stone held the organization together by his personality and by the sense of loyalty to him as a leader. Many members felt that the great usefulness of the organization was over, that the battle for forest conservation in Colorado had been won. Soon after, Mr. Stone died, among the youngest of very old men I have ever known. His memory will always inspire all who knew him. The world war soon engrossed our attentions and the Association remained in a dormant condition until revived at the present time.

Col. A. S. Peck spoke on the value of the organization as support in his work in administering the National Forests.

PLEASANT THINGS TAKEN FROM LETTERS TO THE EDITOR

"AMERICAN FORESTRY is well worth the money and we would miss it greatly if we did not take it."

OSBORNE & CLARK LUMBER COMPANY.

"I find the magazine useful and like to have it."

M. B. KANNOWSKI.

"I take pleasure in expressing appreciation for the AMERICAN FORESTRY magazine, which is a most valuable publication."

WILLIAM O. SMITH, Hawaii.

"I appreciate the need of your Association and the value of its work."

(Prof.) GEO. H. BARTON.

"AMERICAN FORESTRY is a delight to peruse and you deserve the thanks of every nature lover for giving us such a publication."

H. B. DECKER.

"I am very glad to be able to send my check for Sustaining Membership in the American Forestry Association, as I think it is one of the most worth-while organizations in the country, not only from an economic standpoint but from its educational value."

DUDLEY FRENCH.

"I believe every one in the Forest Service recognizes the great value of the AMERICAN FORESTRY Magazine. It is and has been doing the pioneer work which some day will bring a greater realization to the American public of the value of our mountains, watersheds, timber, etc."

THOMAS W. SLOAN.
U. S. Forest Supervisor.

"I have been subscribing to AMERICAN FORESTRY since it was first issued, and it is a welcome visitor to our home."

BERTRAM N. STUMP.

"I want to tell you what a wonderful progress has been made in AMERICAN FORESTRY magazine even in one year. The April number is simply lovely."

MRS. H. E. BREWER.

"Your Association has been doing a wonderful work and I am greatly interested in seeing it continue to be the wonderful success it is."

CYRUS E. WOODS.

"You will find enclosed a money order for \$4.00, which even it were my last would go to continue my subscription to the AMERICAN FORESTRY magazine."

BEN KRIM.

"I thoroughly enjoyed the article in the July issue entitled 'Snake Lore for Forest Lovers' by R. W. Shufeldt. I am glad to see this neglected and misunderstood phase of biology presented in such an excellent manner. I certainly hope that more articles on the same subject appear from time to time in order that the general public, yes and scientific people, may come to realize the great and valuable role played in Nature by reptiles."

DONALD L. BURDICK.

"We are very much pleased with Mr. Pack's article in the July number of your splendid magazine."

W. H. SULLIVAN.

"I am always much interested in the articles in AMERICAN FORESTRY and would not wish to miss a single copy."

H. C. MITCHELL.

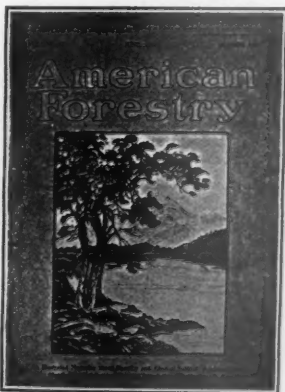
"The magazine (June) is a rich one—strongly interesting from first to last. Gleason's and Demaray's articles, with their richness of fine illustration, are sure to be so attractive to the general reader that I am pleased to place it in our rather meagerly equipped library."

R. H. YOUNG.

BECOME A MEMBER

Any person may become a member of the American Forestry Association upon application and payment of dues.

PLANT TREES
PROTECT FORESTS
USE FORESTS



This is the only Popular National Magazine devoted to trees and forests and the use of wood.

FILL OUT THIS BLANK:—

American Forestry Association

1214 SIXTEENTH STREET N. W. WASHINGTON, D. C.

I hereby request membership in the American Forestry Association and enclose check for \$.....

INDICATE CLASS OF MEMBERSHIP

Subscribing Membership, per year.....	\$ 4.00
Contributing Membership, per year.....	10.00
Sustaining Membership, per year.....	25.00
Life Membership (no other dues).....	100.00
Annual Membership	1.00

Name.....

Street.....

City.....

FOREST PROTECTION IN PENNSYLVANIA

Forester Pinchot of Pennsylvania has devised a method of fixing the legal and financial responsibility for all forest fires, and in his new organization men who combat fires will receive pay commensurate with services performed.

Nowhere in the United States has so complete a plan been perfected for the prompt detection and extinction of fires, and for the inspection and elimination of hazards.

An appropriation of \$1,000,000 by the Legislature for forest protection has made it possible for the Department of Forestry to purchase and erect 50 steel forest fire observation towers. Most of these towers are sixty feet high, and they have been put up on the highest mountain tops in the State. Eighteen other steel towers were previously erected, giving the Department of Forestry sixty-eight stations from which observers may detect and locate forest fires. Every one of the towers is connected by telephone with men in nearby communities whose duty it is to respond with a crew of men to attack the flames when fire is discovered.

Roads and trails have been constructed in many of the State Forests, so that the remote sections are now more accessible to foresters and their fire-fighting crews. Each forest district has been divided into blocks of forest land, extending from 50,000 to 150,000 acres. Each area is in charge of an inspector, each tower is manned by a towerman, fire bosses have been elected from the best fire wardens located at convenient points for the suppression of fire.

Fire crews have been organized, equipped and trained so that they are ready immediately to respond when calls come to the fire bosses from towermen or inspectors. Patrolmen and wardens are other units in the fire protective organization.

This organization, heading in the office of each District Forester, has given Pennsylvania a systematic plan for the prevention of forest fires that is far better than anything of a similar nature that has been attained in this country.

GEORGIA COMMITTEE INCREASES

New members are being added to the Georgia Committee of Forestry and plans are going forward for the work. This committee is separate and apart from the Georgia State Board of Forestry, which recently met at the State Capitol in the offices of Governor Hardwick, who is an ex-officio member of the Board. The membership of the Georgia Forestry Committee includes the names of many of the most prominent men and women in the State, and the interest and activity already evident gives promise of vigorous accomplishment.



Make it a General Order

"Christmas Seal All Christmas Mail"

"Letters—invoices—packages—every piece of mail should bear tuberculosis Christmas Seals."

Will you issue such an order and help us continue the health work which is saving over 75,000 lives in the United States each year?

The result of this tremendous crusade amounts to an economic saving of hundreds of millions of dollars annually—a salvage that affects every business in America.



The National, State and Local Tuberculosis Associations of the United States

INCREASED PRODUCTION OF NAVAL STORES.

Compilation of reports from the individual producers and consumers of naval stores for the 1920 producing season by the Bureau of Chemistry, United States Department of Agriculture, shows that 488,548 casks of gum spirits of turpentine and 1,577,398 round barrels of gum rosin were made. There were on hand at the stills on March 31, 1921, the close of the 1920 season, 30,429 casks of spirits of turpentine and 327,055 round barrels of rosin.

During the calendar year 1920 a total of 34,932 casks of wood turpentine and 180,-

138 barrels of wood rosin and reclaimed rosin were made. The stocks at wood-distilling and rosin-reclaiming plants on December 31, 1920, were 7,616 casks of turpentine and 50,882 barrels of rosin.

On March 31, 1921, the consuming industries of the country had on hand or in transit to the plants a total of 30,528 casks of turpentine and 217,302 barrels of rosin. On this same date the stocks at the ports and in hands of large dealers and jobbers at the principal distributing points of the country were 74,686 casks of turpentine and 479,142 barrels of rosin.

STATE FORESTERS STUDY BLISTER RUST

(Continued from page 782)



FAIRBANKS-MORSE
Forest Fire Pumping Outfit
Portable, Lightweight Direct-Connected Gasoline Engines and Pumps For Fire Fighting
 USED by the Canadian Government and the Canadian Pacific Railway. Will throw water to a height of 172 feet. Shipment complete, ready to run. Can be quickly moved to any endangered section by auto, pack horses or boat. Write for Bulletin H-7013.
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**Bleached, Easy Bleaching,
 Unbleached Sulphites,
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 Ground Wood Pulp**

DOMESTIC EXPORT

A FRIEND IN NEED, IS A FRIEND INDEED

You will cement friendship by making your friend a member of the Association. It costs only four dollars a year.

generally distributed, resulting in pine infection of great intensity. On an acre plot, typical of conditions over an area of several thousand acres, the foresters found 70 per cent of the trees under 10 feet high attacked by the disease, mostly 1919 infection. The pine growth is very dense, but nevertheless, approximately 400 wild gooseberry and skunk currant bushes were found on the acre. A pine tree 7 inches in diameter, breast height, had 50 cankers on its stem and lower branches, within 8 feet of the ground.

A stop was made to inspect a white pine planting made in 1909, where the disease was first introduced into the North Hudson section. The planting stock was imported from a German nursery. From 1917 to 1920 blister rust was found on a few pines here and there within a radius of ten miles of this plantation. In the spring and summer of 1921, millions of cankers developed on the pines in this territory, due to general infection of currant and gooseberry bushes in 1919. So severe is the infection on the pines that it can best be likened to the effects of forest fire.

Returning to Chestertown, the foresters saw the Faxon white pine plantation, now 37 years old, which is producing lumber at the rate of approximately a thousand feet B. M. per annum. In the same locality, a visit was made to a ten acre tract which was cultivated in 1865 and bore no tree growth prior to 1874. White pine seed trees grew on adjacent land and there is now a splendid growth of straight, clean pine, 47 years old, 90 to 100 feet high, with many trees 18 to 19 inches in diameter, breast height. Sample plots were measured by a timber estimator of the New York Conservation Commission, and the Massachusetts white pine volume table was applied. On one quarter-acre plot the yield was estimated to be at the rate of 78,000 feet B. M. per acre, and on another plot it exceeded 87,000 feet B. M. to the acre. Pine from a portion of this tract was sold last winter at a price which netted the owner \$17.50 per thousand feet B. M. "on the stump."

It is safe to estimate that this stand will average 47 thousand feet per acre, or a growth of a thousand feet B. M. per annum. In 1918 the currants and gooseberries were removed from this tract at a cost of less than a dollar per acre. A portion of the area was cut over last winter and a very heavy seedling growth of white

pine has developed from last year's seed crop, since a few seedling wild gooseberry bushes will spring up among these small pines, the ground will have to be covered again, within the next three or four years, but the probable cost will not exceed 50 cents per acre for the second working. An insurance charge of 20 cents per year for protecting a pine crop that yields at the rate of \$17.50 annually, makes it clear that white pine can still be grown profitably in spite of the blister rust. But pine cannot be grown commercially in the infected regions if currant and gooseberry bushes are not eradicated.

The Society for the Protection of New Hampshire Forests held its annual meeting on August 31 and September 1 at North Woodstock, N. H. On September 2, many of those in attendance motored to Littleton, N. H. to view the extensive damage from blister rust in that locality. For many miles around Littleton, infection is general, plot studies showing from 50 to 90 per cent of the pines attacked. Currants and gooseberries have been eradicated from much of the land in this locality at costs ranging from 75 cents to \$1.00 per acre. However, the destruction of currants and gooseberries protects only the healthy pines. It cannot save pines infected before the work is done.

Both the New York and the New Hampshire meetings passed strong resolutions, urging pine owners in the Northeastern States at once to uproot currants and gooseberries within 200 to 300 yards of the pines. More adequate State and Federal appropriations were also urged for instructing pine owners in regard to the disease and demonstrating methods of control. Those in attendance at these meetings saw convincing evidence of the destructive power of the blister rust. The point was made clear to all that the disease can be controlled at a reasonable cost, by destroying currants and gooseberries within 200 to 300 feet of the pines. However, it is readily seen that not many land owners will go to the trouble of uprooting wild currants and gooseberry bushes until they are aware of the presence of the rust on their pines. Few pine owners know all species of wild currants and gooseberries, nor is it possible to clear the ground of these bushes if the work is done in an unsystematic, hit-or-miss manner. A few hours spent in practical demonstration accomplishes results that cannot be obtained through printed warnings and instructions.

ENGLAND'S NEW FOREST POLICY

(Continued From Page 754.)

indeed the appropriation to deal with unemployment may prove to have been the only thing which tided the Commission over the immediate emergency. Public

opinion alone is a permanent guarantee against a failure, which to the British nation would be little less than calamitous.

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BOASTS VENERABLE TREES

Some of the oldest plantations of forest trees in New York State have been discovered at Millbrook, Dutchess county, by workers from the forestry department of the state agricultural college at Ithaca, according to the local paper, "The Mirror and Reading Table." The record trees are on the Dieterich Estate at Millbrook, and are in a forest preserved principally as a home for game, where deer and other animals have the freedom of the woods.

Members of the forestry department of the college are available, usually through county agents, to look over forest plantings and give advice and help as to the benefits of this long-time crop.

REVISING POLE SPECIFICATIONS

AT the request of the overhead systems committee of the National Electric Light Association the Forest Products Laboratory is collecting data on the taper and strength of various pole species, including southern yellow pine, chestnut, western red cedar and northern white cedar, in order to check up, or, if need be, revise their standard specifications for poles. Data are also being collected on the efficiency of various treatments commonly used for poles. These data are based on the results of service tests by the Forest Products Laboratory that have extended over a period of approximately fourteen years.

MORE FOREST EXPERIMENT STATIONS

America must take measures to meet a critical timber situation which is yearly becoming more critical, the Forest Service, United States Department of Agriculture, reports in a review of conditions existing in the forests and the wood-consuming industries. The ax has cut to the heart of eastern American forests and immediate steps should be taken to grow timber if this country is to avoid dependence on foreign supplies with drastic limitations in amount and the excessive prices which such a situation would impose.

"We have already cut or burned over five-sixths of our original timber area of 822,000,000 acres," says the report. "Three-fourths of our total utilization and practically all the high grade material is still from virgin stands. We can not indefinitely use or destroy 26,000,000,000 cubic feet a year and grow only 6,000,000,000. We shall soon have to grow a much larger part of the 20,000,000,000-foot difference. Forest experiment stations are needed to find out and demonstrate how to grow this enormous volume of wood."

Eventually 10 such stations, each with a technical staff of from 6 to 12 men, are needed, the service states, 5 in the East, 3 in the Rocky Mountains and 2 on the Pacific coast. At the present time there are 2 stations in the East and 1 in the West, the others, through lack of funds, being reduced to a one-man basis. Where the proposed stations are needed is summarized as follows:

In the Southern pine belt, where four-fifths of the original 650,000,000,000 feet have been cut since 1870, chiefly since 1890, and where the crest of production already has passed, and with it is going world leadership in the naval-stores industry. That leadership, it is stated, is passing to the artificially established maritime forests of France.

In the Lake States where a supposedly inexhaustible supply has disappeared precipitately within the past 20 years and where utterly inadequate steps to reforest are being made.

In the Northeast, where the timber problems of New England, and northern and eastern New York press for solution, with the Government doing no research work of that kind whatever.

In the Alleghenies, where forest problems of Pennsylvania, southern and western New York, Ohio, Maryland, New Jersey and Delaware are also receiving no investigative attention from the Federal Government, although production has fallen spectacularly and a tremendous acreage is barren of trees at this time.

In the Appalachian Mountain forest region, chief source of the hardwood sup-

ply, where production has decreased nearly 60 per cent in 9 years.

In the various Rocky Mountain ranges, where 3 stations would cover, respectively, central and northern Idaho, western Washington and western Montana; the central Rocky Mountain region; and Arizona, New Mexico and Southern Utah. Artificial reforestation probably will be necessary there to place timber on 5,000,000 acres of waste lands.

On the Pacific coast—2 stations—where over half of the present remaining timber supply is located.

GOING TO THE PRAIRIE FOR TREES

One does not go to the Arctic for fruit nor seek furs in the tropics and the last place on earth the average individual would think of securing trees would be the Canadian prairies. The very word conjures up a picture of vast stretches of interminable treeless plains, for a great section of the people of the continent are unaware of what a misnomer the term is and how these plains made to glow golden with the first grain of the country have been beautified by the extensive planting of trees of every sort which thrive lustily as if sprung naturally from the soil.

That the whole continent does come to the Canadian prairies for trees is evident in the history of the Prairie Nurseries in Saskatchewan, the largest nursery concern in Western Canada and claimed to be the largest grower of Caragana and Russian poplar in the world. Not only have millions of trees been sent out to cover the Prairie Provinces from the nursery but their product is shipped as far east as Fort William and as far north as the Peace River Country. Nurseries in British Columbia and Ontario also purchase considerable stock from it, and shipments of considerable size have been made to the United States, these including in the past year, 140,000 Caragana and 80,000 Box Elders or Manitoba Maples.

The greater part of the nursery is taken up with plantations of the hardiest trees and shrubs, Russian Poplar, Laurel Willows, Manitoba Maples and Caragana. A beautiful new hedge shrub, the Russian Olive, as well as Buckthorn, is also grown largely for hedges, but the Caragana is the most popular and 3,000,000 seedlings of this variety were grown this year. A large stock of the hardiest apples, plums, cherries and small fruits is grown with the demand increasing every year. The demand for fruits and ornamental shrubs taxes the utmost resources of the nursery, especially currants, raspberries, and strawberries.

BOOKS ON FORESTRY

AMERICAN FORESTRY will publish each month, for the benefit of those who wish books on forestry, a list of titles, authors and prices of such books. These may be ordered through the American Forestry Association, Washington, D. C. Prices are by mail or express prepaid.

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PLANTING FOR REVENUE

Forty years ago Charles W. Garfield then Secretary of the Michigan State Board of Horticulture, arranged a program dealing with farm forestry which was given in the opera house at Hillsdale. It was provoking that an interesting program enlisted little response, and Mr. Garfield said to the farmers assembled, "The time will come, if you maintain this attitude, that you will be crying for some means to cope with the coal barons, and you will have lost your leverage." During the war there was a coal shortage, and those charged with the distribution of the inadequate supply said, "It seems fair to take care first of the need of townspeople. Farmers should have fuel from their woodlands." The coal shortage gave an impetus to farm forestry.

Several years ago the Grand Rapids Board of Trade purchased 10,000 elm trees in France, which, with transportation, cost only a few cents apiece, and distributed them for planting on Arbor Day. In advance, business men spoke at all the schools to give instructions for successful planting. About 70 per cent of the trees lived. How far-reaching would be the result if every one of the 150,000 population of Grand Rapids would make himself responsible for the planting of one tree! Mr. Garfield has hope that some start may be made on such a program next spring.

Further than street planting, Grand Rapids should establish and maintain forests for future revenue. It might be necessary to give the recreational value of such forests the greater prominence at the outset to enlist sufficient interest, but Mr. Garfield feels sure that as in the case of Zurich's town forest, such a venture would eventually yield revenue to the city.

NOVEL FOREST FIRE EXHIBIT

Ernest L. Metcalf, the forest fire warden of Franklin, Massachusetts, placed a unique exhibit in the Labor Day parade in his town. It consisted of three trucks. He dug up in the forest and transferred to one of these trucks a section of burned land, with its burned embers and charred stubs, just as it looked in the woods. To heighten the effect, smudge fires on the truck gave off clouds of smoke. On the second truck he showed the remedy for this sort of burned land—reforestation, by displaying young pines from four to ten years old set in earth. The third truck was the town forest fire apparatus, with full equipment. Along the route of the parade he gave out announcements of the free distribution of young trees which were to be given to school children for planting, and which were furnished by the State Nursery at Bridgewater.

MAKING EVERGREEN TRANS-PLANTING PRACTICAL

Transplanting anything from a head of lettuce to a large evergreen is always a fussy job and one that is not always successful. In fact, with the large plants and trees, says the *Scientific American*, transplanting becomes difficult and problematical, especially in the case of evergreens which often die after being transplanted. This is attributed to the fact that the sacking enclosing the roots and earth ball forms more or less a flexible container, and the jars incidental to transportation quickly cause the earth around the vital roots to become loosened therefrom with serious or even fatal results.

With these facts in mind Lionel Weil of Goldsboro, North Carolina, has invented a transplanting receptacle which may be employed in transplanting all types of plants but more particularly trees of a less heavy nature. The receptacle consists of a metal casing, properly hinged, which is placed around the roots and earth ball of the tree to be transplanted. Metal slides at the bottom of the receptacle prevent the dirt from falling out of the tapered receptacle. Straps and buckles hold the earth ball firmly in place. In transplanting the tree a hole is first dug, after which the tree or plant with the receptacle still about it is placed in position. The bottom slides are removed, the buckles undone, and the receptacle is removed, following which earth is packed around the earth ball containing the unimpaired roots.

PENNSYLVANIA'S PULP INDUSTRY

To maintain the pulp mills of Pennsylvania and supply them continuously with wood there will be required 500,000 acres of well-managed forest land. There are 13 pulp mills in the State and they consume about one-half million cords of wood every year. These figures were compiled by the Pennsylvania Department of Forestry at the conclusion of a survey of the pulpwood industries. More than \$50,000,000 are invested in Pennsylvania's pulp mills, and last year they gave employment to 7,144 persons. In 1920, they paid for wages and salaries about twelve and one-half million dollars, and they turned out wood pulp valued at more than \$60,000,000. The Department of Forestry's investigation showed that in the pulpwood consumption 55,000 cords of slab and other mill waste were used. This use of mill waste comprises more than 11 per cent of all the wood used in the State. The pulp mills of Pennsylvania consume more than one-third of all the mill waste used by the pulp mills in the nation. Four of the mills within the State import all of the wood they use, and eight of the thirteen mills import more than 75 per cent of the wood they consume, and all but three of the mills import more than 50 per cent of the wood consumed.

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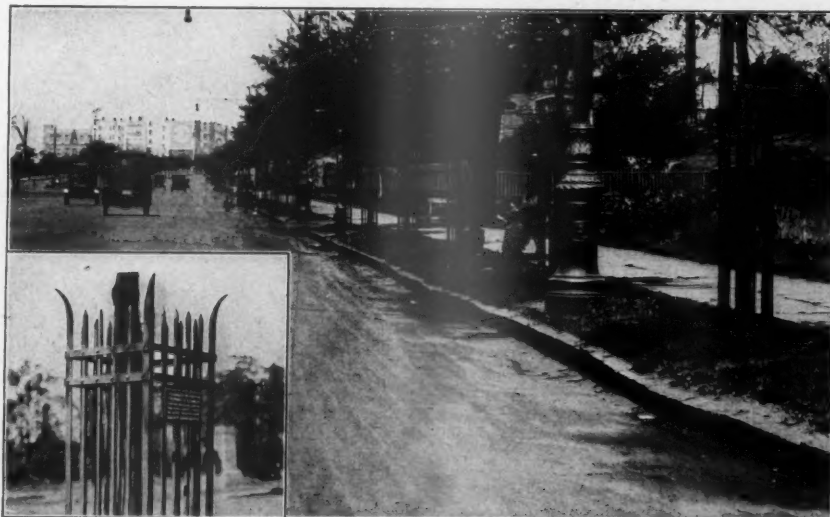
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ATTENTION, FORESTERS

AMERICAN FORESTRY will print, free of charge in this column, advertisements of foresters wanting positions, or of persons having employment to offer foresters. This privilege is also extended to foresters, lumbermen and woodsmen, discharged or about to be discharged from military service, who want positions, or of persons having employment to offer such foresters, lumbermen or woodsmen.

POSITIONS WANTED

POSITION WANTED as City Forester or Park Superintendent. Have had practical experience as Manager of Private Estates and have been 14 years in present position as Park Superintendent. Desirous of making a change at this time. Address Box 3005, care of AMERICAN FORESTRY, Washington, D. C. (9-11-21)

TREE SURGEON—Formerly employed by the Davey Tree Expert Company, desires to make connection with some reliable company doing work such as tree surgery, or private work on large estate. Will consider reasonable salary to start if good future offers. Address Box 3010, care AMERICAN FORESTRY, Washington, D. C. (9-11-21)

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CITY LANDSCAPE ARCHITECT AND FORESTER, thoroughly conversant with Southern conditions, desires to change. Correspondence invited. Address D, care AMERICAN FORESTRY Magazine, Washington, D. C. (9-11-21)

EX-SERVICE MAN; age 30; married; two and one-half years in forestry college; experienced in city forestry, nursery work, tree surgery, dynamiting and in handling men; wishes position in city forestry or park department any where in northeastern United States. Now employed. Address Box 3025, care AMERICAN FORESTRY MAGAZINE, Washington, D. C. (10-12-21)

WINTER POSITION wanted with lumber company as time keeper or similar work. Graduate of high school and ranger course, 25 years old, good references from previous employers. Address Box 3030, care AMERICAN FORESTRY MAGAZINE, Washington, D. C. (10-12-21)

FORESTER—Graduate of Penn State, 28 years of age, desires work in Forestry or allied lines. Varied experience in Forestry and lumbering. Served with 10th Engineers and with Wood Supply Branch in France. Will consider any outdoor work with a future. Address Box 3035, care AMERICAN FORESTRY MAGAZINE, Washington, D. C. (10-12-21)

WANTED

FORESTERS, UNEMPLOYED OR EMPLOYED, having executive ability and possessing the gift to lead others, to write us. Great opportunity for those that qualify. State age, —reference—(2) if employed. School graduated from (years). Confidential. Rangers also answer this. Address Box 66-66, AMERICAN FORESTRY MAGAZINE, Washington, D. C.

CITY FORESTERS—The Oklahoma Forestry Association, in order to assist cities and towns in Oklahoma to procure men with technical training and practical experience in city forestry work desires names of qualified men. Please send name and address, giving age, training and experience to the Secretary, THE OKLAHOMA FORESTRY ASSOCIATION, Stillwater, Oklahoma.

YALE FOREST SCHOOL

The Yale Forest School has recently received a gift of \$300,000 from William H. Sage, Yale '65, to be used in the erection and maintenance of a building in memory of his son, DeWitt Linn Sage, a member of the class of 1897, which will enable the school to proceed with this improvement on a scale commensurate with the growth of the institution. It will also give much needed space for the proper display of the large collection of woods now owned by the School. The number of wood samples which the School now possesses has been increased to 4,725 by recent gifts from Mr. H. M. Curran lecturer on South American forests. The library of the School which is the largest and best collection of books, periodicals and pamphlets on forestry in this country, outside of the United States Forest Service, will be housed in the new building where it will be secure from the fire hazard to which it is now subjected.

The School has recently received a legacy a tract of forest land located near Wilkes Barre, Pennsylvania.

Nineteen students are this year candidates for the degree of Master of Forestry and the total enrollment is forty-two, including seven enrolled for the summer term only. Twenty-four universities and colleges are represented in this attendance. The students come from twelve different states and four foreign countries namely South Africa, Australia, Norway and China.

Prof. S. J. Record is giving a course of lectures to a class of forty members of the New York Lumber Trade Association in New York City.

Research in silviculture is being conducted under a fellowship by F. L. Dumond a graduate student from Cornell University.

ENROLL FOR RANGER COURSE IN IDAHO

The work of the first term in the Ranger Course offered by the Idaho School of Forestry got under way during the week of October 17 with a good enrollment in both the first and second year classes. The fact that the registration again drew men from all sections of the country demonstrates the widely felt need for this class of training. In addition to the regular Ranger Course of two years of five months each, the work at the Idaho School of Forestry is so arranged during the second term that a short course of three months' duration may be secured by rangers, guards and others who cannot spare the time required for a fuller course. This second term course of three months will open January 4, 1922 and close on March 24. Anyone desiring further information in regard to this course should communicate at once with Dean F. G. Miller, School of Forestry, University of Idaho, Moscow, Idaho.

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